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FINAL REPORT

MAY 21 1963

Plowshare

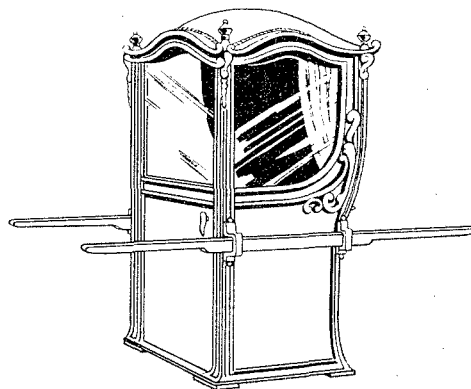
/ peaceful uses for nuclear explosives

ACCESSION NO.

UNITED STATES ATOMIC ENERGY COMMISSION / PLOWSHARE PROGRAM

project SEDAN

NEVADA TEST SITE / JULY 6, 1962



NEVADA
CALIFORNIA

Las Vegas •



Final Off-Site Report

O. R. Placak

U. S. PUBLIC HEALTH SERVICE

ISSUED: APRIL 25, 1963

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NUCLEAR EXPLOSIONS — PEACEFUL APPLICATIONS

FINAL OFF-SITE REPORT
OF THE
PROJECT SEDAN EVENT

July 6, 1962

PLOWSHARE PROGRAM

DISTRIBUTION STATEMENT A
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By

U. S. Public Health Service
Off-Site Radiological Safety Organization

O. R. Placak, Officer-in-Charge

December 12, 1962

FORWARD

The purpose of this report is to present a summary of the Off-Site Radiological Safety activities of the U. S. Public Health Service during the Project Sedan Operation.

The report is intended to serve as a source of information concerning the procedures followed to protect the off-site population from ionizing radiation and to present the data obtained during these activities.

It is neither possible nor desirable to include in this report all the individual data collected by the U. S. Public Health Service; however, in the event that more detailed information is desired, it may be obtained from the PHS Off-Site Activities, P. O. Box 684, Las Vegas, Nevada.

Every effort has been made to make this report as comprehensive as possible and to eliminate errors; however, if any anomalies are detected, it would be appreciated if they would be called to our attention for verification.

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OPERATIONAL PROCEDURES

The U. S. Public Health Service Off-Site Radiological Safety Organization of the Nevada Operations Office, AEC, was responsible to the Test Manager for the establishment of a program to provide documentation of any radiation exposure to the off-site population resulting from Project Sedan. This included the establishment of a procedure for taking appropriate action to limit exposure to those values established by the Atomic Energy Commission which was considered safe criteria for the Sedan event. These criteria were outlined in Chapter 0524, Off-Site Rad-Safety Operations, of the SOP-NTO as revised.

An expanded public relations program in the off-site area surrounding the Nevada Test Site had been in effect since February 1962. This program consisted of U. S. Public Health Service Off-Site Radiological Safety Organization representatives making weekly visits to the residents of the off-site area, explaining the USPHS radiological safety activities and presenting brief talks and movies to civic groups and schools. In addition, many residents were given film badges to wear and others operated air samplers for the USPHS, thus giving the people a sense of participation in the program. As a result, by July 6, 1962, the date of the Sedan event, most people in the NTS vicinity were familiar with the off-site rad-safe activities and were accustomed to the presence of USPHS personnel in the field.

The off-site area defined as the responsibility of the U. S. Public Health Service by a Memorandum of Understanding between the Public Health Service and the Atomic Energy Commission was the area extending from the boundaries of the Nevada Test Site to as far as circumstances warranted. To fulfill this responsibility, trained USPHS personnel assigned to the Las Vegas, Nevada Operations Office were utilized to document the event and take necessary action for public safety of the off-site area during the operation. In addition, PHS Reserve Officers who had experience in monitoring were called to active duty to assist in the activities.

The U. S. Weather Bureau at the Control Point furnished predicted cloud trajectory maps and meteorological information which was used to direct monitoring teams prior to and during the operation.

COLLECTION OF DATA

As outlined in the Off-Site Radiological Safety Plan for Project Sedan, dated May 29, 1962, the basic objectives of this program were:

1. Determine the extent of airborne, surface, and subsurface contamination off-site resulting from the operation.
2. Maintain a comprehensive record of radioactivity associated with the operation, including negative data.
3. Insure continuing protection of the public health.
4. Be prepared to effect emergency measures should an unacceptable situation develop.
5. Conduct necessary information activities in surrounding communities to maintain public confidence in the safe conduct of the operation.
6. Investigate incidents that might possibly be attributed to the operation.
7. Distribute and collect film badges.
8. Provide mobile monitoring teams in selected populated places relatively near the operation site.
9. Expand air sampling equipment and continuous recorders.
10. Operate the off-site communications net.

To carry out these objectives and secure the facts and data, it was necessary to perform many operations concurrently and utilize equipment and personnel to the best advantage in the operations.

SYNOPSIS

The Project Sedan event was conducted as a part of the Plowshare Program at 1000 hours on July 6, 1962, in Area 10 of the Nevada Test Site by the Lawrence Radiation Laboratory.

The Project Sedan nuclear cratering experiment resulted in the formation of a radioactive cloud which drifted northward on a 10 degree bearing for 40 miles to the vicinity of Queen City Summit, and then moved on a 20 degree bearing to Ely. From here, a nighttime wind shift carried the cloud eastward.

The highest estimated total infinite exposure dose received at a populated location from the Project Sedan event was 945 mr at Diablo (population eight), and the second highest was 226 mr at Penoyer (population two). These are calculated infinite doses. Personal film badges worn by the residents and collected on July 9, 1962, indicate 150 to 170 mr dose at these two locations. In order to insure a minimum of exposure, the people at these two locations and Tempiute (population three), were relocated during cloud passage.

The results of monitoring and environmental sampling efforts conducted by the U. S. Public Health Service Off-Site Radiological Safety Organization are presented in the following report.

Chapter I

Aerial Monitoring

Two U. S. Air Force aircraft and crews were utilized by the Off-Site Radiological Safety Organization to provide cloud tracking information for Project Sedan. One high altitude and one low level unit was used. In each aircraft, a PHS team of two monitors carried AN/PDR-39 survey meters, Beckman MX-5 survey meters, and an EG&G Aerial Monitor radiation recorder. This combination of instruments enables measurement of gamma radiation intensities from 0 to 50 R per hour.

The high altitude aircraft devoted most of its efforts to cloud positioning. The cloud path as determined from the crew reports and other ground sources is shown in Figure II of Chapter II. The cloud height was estimated at 20,000 feet Mean Sea Level, and a pass over the cloud at 21,500 feet MSL at 1040 hours gave a reading of only 1 mr/hr.

The low altitude aircraft chose not to penetrate the cloud until approximately 1500 hours in order to keep plane contamination to a minimum. A summary of the readings then recorded in the cloud is presented in Table I. The figures given have been corrected for aircraft contamination.

The readings from 1508 to 1536 were recorded on the EG&G Aerial Monitor recorder and are corrected for altitude and aircraft attenuation. These readings, then, represent ground activity levels. All other intensity readings listed in the table are not corrected for attenuation, and therefore show activity levels inside the aircraft.

In an effort to obtain an intensity profile of the radioactive cloud, a west to east pass was flown through it at 1700 hours. This series of readings appears in the table from times 1652 hours to 1714 hours, and gives a cloud width of approximately 55 miles in the Currant vicinity. After locating the leading edge of the cloud fifteen miles south of Ely at 1729 hours, the aerial monitoring mission was terminated.

TABLE I
AERIAL MONITORING RESULTS
PROJECT SEDAN

TIME	AZIMUTH, DEGREES	DISTANCE, MILES	ELEVATION, FEET, MSL	LOCATION	GROSS GAMMA mr/hr
1120	360	0	8500	Ground Zero	40
1435	360	0	5500	Ground Zero	14,000
1436	360	0.5	5500	0.5 mile north of Ground Zero	10,000
1508	32	36	300 ^a	15 miles SE of Queen City Summit over Highway 25 (Koyen's Mill)	3
1510	28	37	300	12 miles SE of Queen City Summit over Highway 25	2
1512	22	38	300	8 miles SE of Queen City Summit over Highway 25	3
1514	16	39	300	4 miles SE of Queen City Summit over Highway 25	8
1516	11	40	300	Queen City Summit	20
1518	6	42	300	4 miles NW of Queen City Summit over Highway 25	60
1520	2	44	300	8 miles NW of Queen City Summit over Highway 25	45
1522	359	53	300	12 miles NW of Queen City Summit over Highway 25 (Diablo)	30
1524	359	57	300	16 miles NW of Queen City Summit over Highway 25	30
1526	359	61	300	20 miles NW of Queen City Summit over Highway 25	25
1528	359	65	300	24 miles NW of Queen City Summit over Highway 25	18
1530	358	67	300	28 miles NW of Queen City Summit over Highway 25	14
1532	358	68	300	32 miles NW of Queen City Summit over Highway 25	14
1534	357	69	300	36 miles NW of Queen City Summit over Highway 25	9
1536	355	72	300	40 miles NW of Queen City Summit over Highway 25 (Twin Springs)	2
1540	12	77	5400	Nyala	25
1543	13	79	5400	3 miles north of Nyala	30
1545	15	89	5400	Blue Eagle Ranch	40
1555	15	113	5400	Currant	3
1652	5	109	12,500	20 miles west of Currant	Bkg
1654	8	110	12,500	15 miles west of Currant	7
1656	10	111	12,500	10 miles west of Currant	10

Note: a = Altitudes listed as 300 feet indicate altitude above the surface. All other readings are feet above Mean Sea Level.

Table I
Aerial Monitoring Results
Project Sedan

TIME	AZIMUTH, DEGREES	DISTANCE, MILES	ELEVATION, FEET, MSL	LOCATION	GROSS GAMMA mr/hr
1658	13	112	12,500	5 miles west of Currant	20
1700	15	113	12,500	Currant	20
1700	16	113	12,500	1.25 miles east of Currant	4
1701	16	113	12,500	2.5 miles east of Currant	1
1701	17	114	12,500	3.75 miles east of Currant	7
1702	18	114	12,500	5 miles east of Currant	7
1704	20	116	12,500	10 miles east of Currant	15
1706	22	117	12,500	15 miles east of Currant	5
1708	25	120	12,500	20 miles east of Currant	4
1710	27	122	12,500	25 miles east of Currant	2
1712	29	124	12,500	30 miles east of Currant	1
1714	31	127	12,500	35 miles east of Currant	Bkg

Chapter II

Ground Monitoring

Eighteen mobile ground monitoring teams were used by the Off-Site Radiological Safety Organization during the Project Sedan event. These monitors were equipped with Precision Model 111 Scintillators, Beckman MX-5 survey meters, Eberline E-500B survey meters, and AN/PDR-39 survey meters. These instruments have a range of 0 to 5 mr/hr, 0 to 20 mr/hr, 0 to 2,000 mr/hr, and 0 to 50,000 mr/hr, respectively. In addition, most teams carried additional air sampling units, Eberline RM-5 radiation recorders, and a stock of monitoring and sampling supplies. Ground units were in continual two-way radio contact with Control Point headquarters and the cloud positioning aircraft.

In order to provide the best documentation of exposures received by the off-site population from Project Sedan, more emphasis was placed on monitoring at and in the vicinity of populated locations in the cloud path, rather than making an overall effort to monitor all roads covering the vast unpopulated areas.

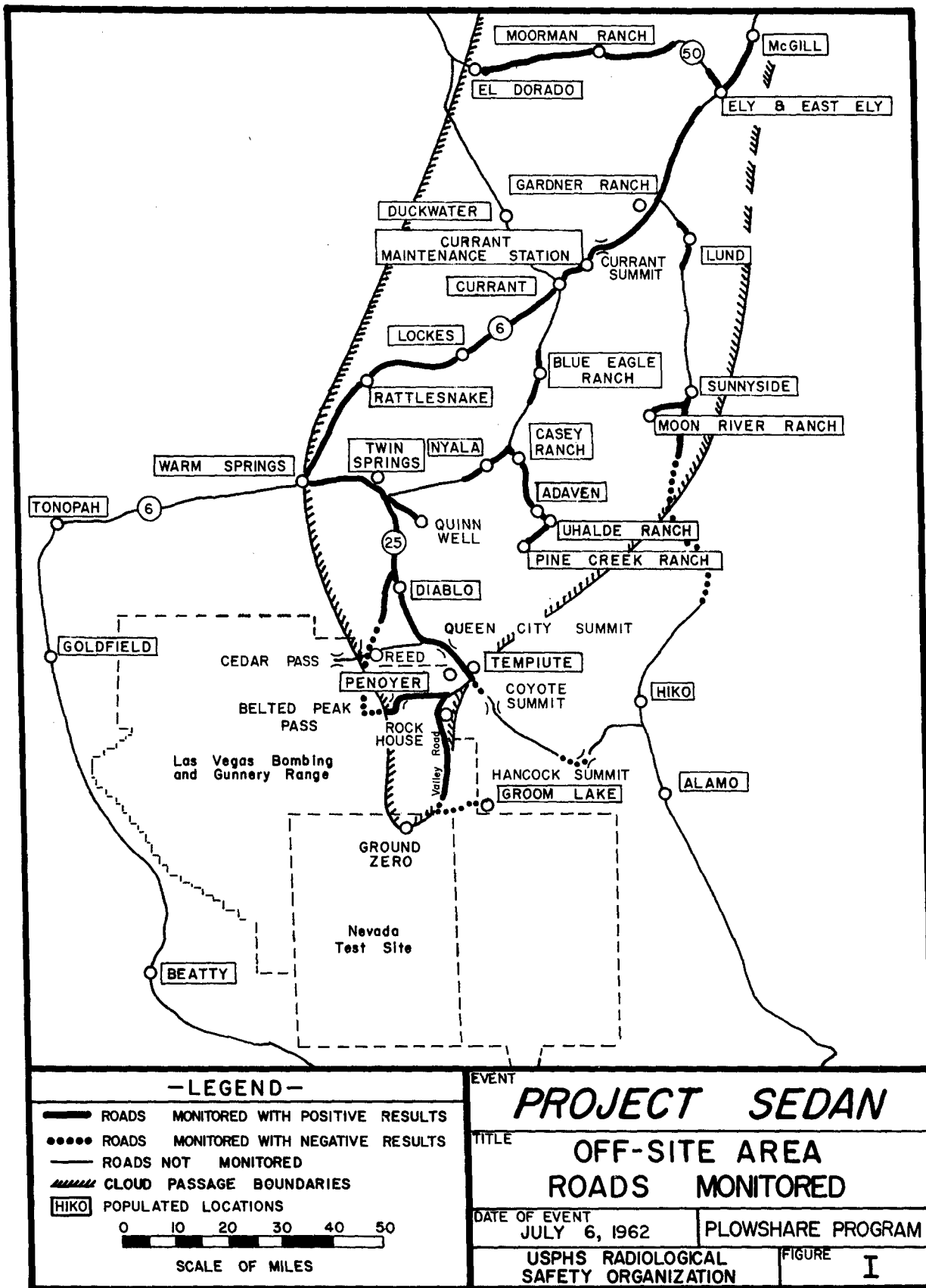
Figure I on a following page shows the areas monitored on the day of Project Sedan. The path of the cloud, as documented by ground and aerial monitoring, and from fallout tray analysis results, is also shown. Past experience has shown that such clouds tend to follow valleys between mountain ridges. This explains the "necking" effect in the Ely vicinity.

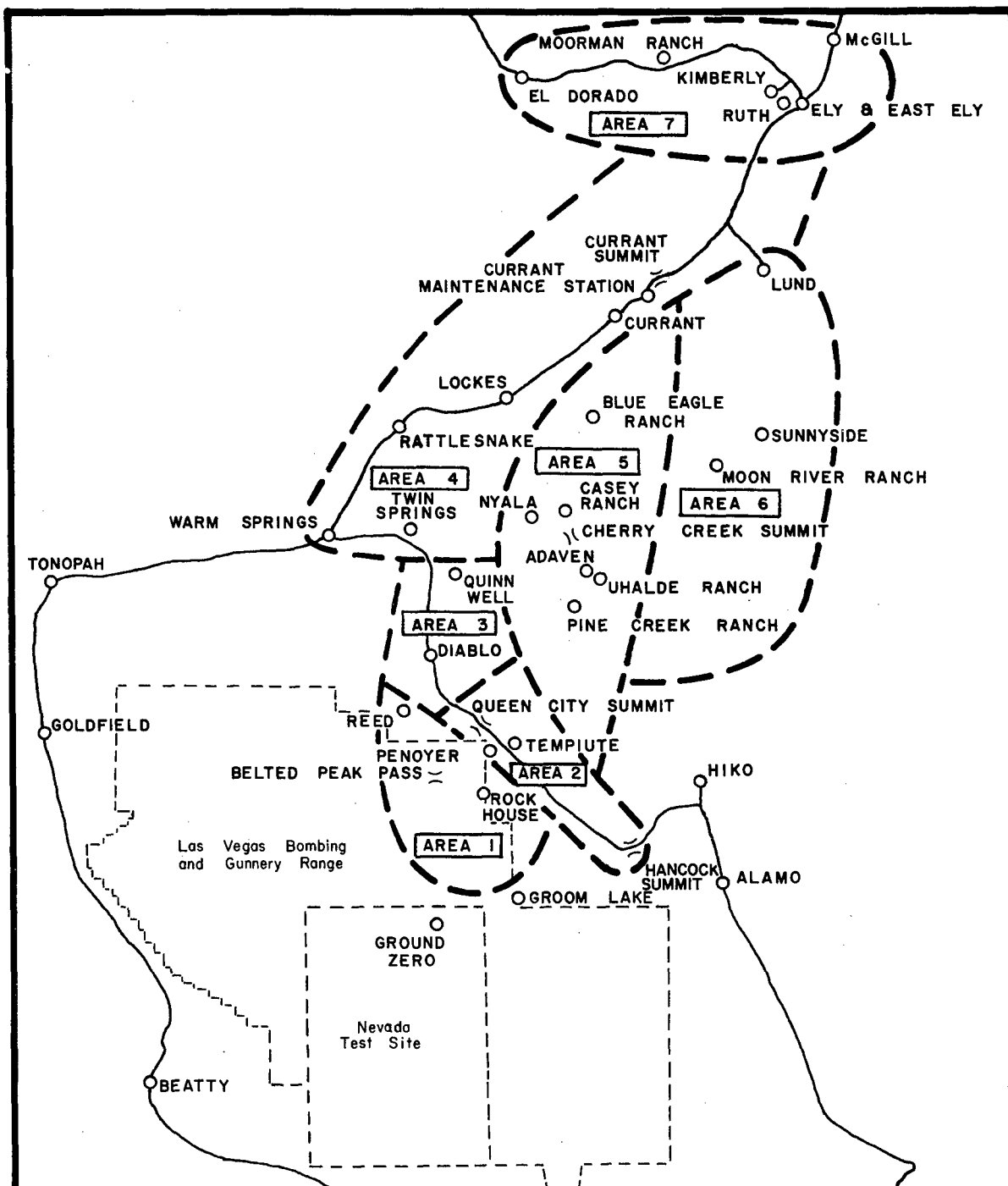
After the cloud passed Ely, a nighttime wind shift carried it eastward. This is shown in Figure III of Chapter III. Table II presents a detailed list of all ground monitoring readings recorded. All readings are three feet above ground, unless otherwise noted. The last page of the table gives a summary of all beta plus gamma readings taken on July 6, 1962. Some readings in Table II have been corrected to eliminate the effects of instrument and personnel contamination during cloud passage. All other readings were made with clean or only lightly contaminated instruments. In order to help the reader in reading Table II, Figure II is presented as an index map. A portion of this map is divided into areas, numbered one through seven. These numbers correspond to those located in the upper right hand corner of each page in Table II.

The people living at Penoyer, Tempiute, and Diablo were not home during the cloud passage. Those living at Twin Springs, Nyala, Casey Ranch, Blue Eagle Ranch, Adaven, Uhalde Ranch, and Pine Creek Ranch stayed indoors during the period of cloud passage. For further information on these activities, see Chapter V. During the time that these people were indoors, a monitor was stationed either with the people or in the immediate vicinity to document exposure levels at the location.

A summary of ground monitoring efforts is presented below. (Some automatic recorder data was also used to complete this summary.)

LOCATION	CLOUD ARRIVAL TIME	CLOUD PEAK TIME	PEAK READING mr/hr
Penoyer	1123	1215	70
Tempiute	1145	1400	1.4
Diablo	1221	1302	324
Pine Creek Ranch	1250	1417	12
Adaven and Uhalde Ranch	1320	1435	12
Twin Springs	1335	1418	30
Nyala	1340	1435	16
Lockes	1452	1530-1600	5.4
Moon River Ranch	1455	1710	2.6
Blue Eagle Ranch	1515	1550	6
Currant Maintenance Station	1623	1738	2.5
Lund	1645	1820	2.8
Moorman Ranch	1750	1915	3
Ruth, Ely, and East Ely	1857	1955	1.2





-LEGEND-

--- AREA BOUNDARIES AS REFERRED TO IN TABLE II

0 10 20 30 40 50
SCALE OF MILES

EVENT

PROJECT SEDAN

TITLE

**REFERENCE MAP
FOR TABLE II**

DATE OF EVENT

JULY 6, 1962

PLOWSHARE PROGRAM

USPHS RADIOLOGICAL
SAFETY ORGANIZATION

FIGURE

II

TABLE II

Area 1

GROUND MONITORING RESULTS - JULY 6, 1962

PROJECT SEDAN

TIME	AZIMUTH, DEGREES	DISTANCE, MILES	LOCATION	NET GAMMA mr/hr
<u>ROCK HOUSE, BELTED PEAK PASS, AND REED AREA</u>				
1145	65 ^b	8 ^b	23.4 miles south of the Rock House	0 ^c
1150	49	10	19.5 miles south of the Rock House	0.03 ^c
1155	36	13	14.0 miles south of the Rock House	1.0 ^c
1200	29	17	10.9 miles south of the Rock House	5 ^c
1205	23	19	7.4 miles south of the Rock House	20 ^c
1207	20	20	6.2 miles south of the Rock House	50 ^c
1210	21	19	5.3 miles south of the Rock House	100 ^c
1211	21	19	4.7 miles south of the Rock House	300
1214	21	17	3.6 miles south of the Rock House	500
1222	13	24	0.8 miles south of the Rock House	800
1225	13	25	Rock House	1000
1234	13	26	2.0 miles north of the Rock House	380
1243	18	30	Belted Peak Pass Rd. - Valley Rd. Jct.	200
1255	15	30	2.4 miles west of Valley Rd. - Belted Peak Pass Rd. Junction	280
1258	15	30	2.7 miles west of Valley Rd. - Belted Peak Pass Rd. Junction	440
1302	12	29	4.2 miles west of Valley Rd. - Belted Peak Pass Rd. Junction	600
1305	10	29	5.0 miles west of Valley Rd. - Belted Peak Pass Rd. Junction	600
1310	8	29	6.3 miles west of Valley Rd. - Belted Peak Pass Rd. Junction	700
1312	4	29	8.0 miles west of Valley Rd. - Belted Peak Pass Rd. Junction	900
1318	4	29	8.7 miles west of Valley Rd. - Belted Peak Pass Rd. Junction	220
1323	357	30	Belted Peak Pass	200
1347	352	28	3.1 miles west of Belted Peak Pass	30
1408	351	26	5.2 miles west of Belted Peak Pass	6 ^c
1416	343	28	8.4 miles west of Belted Peak Pass	0 ^c
1433	349	33	8.3 miles south of Reed	0 ^c
1443	352	38	3.1 miles south of Reed	0 ^c
1452	354	41	Reed	0 ^c
1119	10	29	5.0 miles west of Valley Rd. - Belted Peak Pass Junction	Cloud Arrival
1135	10	29	5.0 miles west of Valley Rd. - Belted Peak Pass Junction	Peak of 1500
1142	10	29	5.0 miles west of Valley Rd. - Belted Peak Pass Junction	1250

Notes: b = Azimuth and distance are from Ground Zero

c = These readings have been corrected to eliminate that part of the reading due to contamination.

Table II
Ground Monitoring Results - July 6, 1962
Project Sedan

Area 1

TIME	AZIMUTH, DEGREES	DISTANCE, MILES	LOCATION	NET GAMMA mr/hr
<u>ROCK HOUSE, BELTED PEAK PASS, AND REED AREA (CONT'D)</u>				
1305	10	29	5.0 miles west of Valley Rd. - Belted Peak Pass Junction	600
1000 to 1545	65	16	Groom Lake	0

Table II
Ground Monitoring Results - July 6, 1962
Project Sedan

Area 2

TIME	AZIMUTH, DEGREES	DISTANCE, MILES	LOCATION	NET GAMMA mr/hr
QUEEN CITY SUMMIT, PENOYER, TEMPIUTE, AND HANCOCK SUMMIT AREA				
1046	11	40	Queen City Summit	0
1130	11	40	Queen City Summit	0
1135	11	40	Queen City Summit	0
1140	11	40	Queen City Summit	0.04
1145	11	40	Queen City Summit	0.02
1150	11	40	Queen City Summit	0.02
1152	11	40	Queen City Summit	0.10
1154	11	40	Queen City Summit	0.3
1156	11	40	Queen City Summit	0.10
1158	11	40	Queen City Summit	25
1201	11	40	Queen City Summit	55
1203	11	40	Queen City Summit	90
1206	11	40	Queen City Summit	130
1210	11	40	Queen City Summit	160
1214	11	40	Queen City Summit	180
1216	11	40	Queen City Summit	500
1220	11	40	Queen City Summit	500
1224	11	40	Queen City Summit	550
1228	11	40	Queen City Summit	475
1232	11	40	Queen City Summit	475
1236	11	40	Queen City Summit	500
1240	11	40	Queen City Summit	450
1242	11	40	Queen City Summit	190
1245	11	40	Queen City Summit	175
1249	11	40	Queen City Summit	165
1253	11	40	Queen City Summit	150
1257	11	40	Queen City Summit	150
1263	11	40	Queen City Summit	145
1308	11	40	Queen City Summit	150
1313	11	40	Queen City Summit	145
1317	11	40	Queen City Summit	135
1325	11	40	Queen City Summit	130
1330	11	40	Queen City Summit	130
1337	11	40	Queen City Summit	125
1342	11	40	Queen City Summit	120
1347	11	40	Queen City Summit	115
1352	11	40	Queen City Summit	110
1556	11	40	Queen City Summit	80
2035	11	40	Queen City Summit	34 ^c
1157	21	37	8.0 miles SE of Queen City Summit on Highway 25	10 ^c

Note: c = These readings have been corrected to eliminate that part of the reading due to contamination.

Table II
Ground Monitoring Results - July 6, 1962
Project Sedan

Area 2

TIME	AZIMUTH, DEGREES	DISTANCE, MILES	LOCATION	NET GAMMA mr/hr
QUEEN CITY SUMMIT, PENOYER, TEMPIUTE, AND HANCOCK SUMMIT AREA (CONT'D)				
1200	18	38	6.1 miles SE of Queen City Summit on Hwy. 25	40 ^c
1202	17	38	4.7 miles SE of Queen City Summit on Hwy. 25	40 ^c
1203	16	38	4.1 miles SE of Queen City Summit on Hwy. 25	60 ^c
1204	15	39	3.1 miles SE of Queen City Summit on Hwy. 25	70 ^c
1205	15	39	2.7 miles SE of Queen City Summit on Hwy. 25	430 ^c
1207	13	39	1.6 miles SE of Queen City Summit on Hwy. 25	470 ^c
1208	13	39	1.6 miles SE of Queen City Summit on Hwy. 25	1960 ^c
1210	14	39	2.5 miles SE of Queen City Summit on Hwy. 25	760 ^c
1215	11	40	0.6 miles SE of Queen City Summit on Hwy. 25	160 ^c
1418	29	36	13.2 miles SE of Queen City Summit on Hwy. 25	0.7
1421	29	36	12.7 miles SE of Queen City Summit on Hwy. 25	0.7
1425	28	37	12.1 miles SE of Queen City Summit on Hwy. 25	0.9
1429	27	37	11.7 miles SE of Queen City Summit on Hwy. 25	1.2
1431	26	37	11.2 miles SE of Queen City Summit on Hwy. 25	1.5
1435	26	37	10.7 miles SE of Queen City Summit on Hwy. 25	3.0
1437	24	37	10.2 miles SE of Queen City Summit on Hwy. 25	3.5
1440	24	37	9.7 miles SE of Queen City Summit on Hwy. 25	5.0
1443	23	37	9.2 miles SE of Queen City Summit on Hwy. 25	6.0
1445	23	37	8.7 miles SE of Queen City Summit on Hwy. 25	9.0
1448	22	38	8.2 miles SE of Queen City Summit on Hwy. 25	10.0
1450	22	38	7.8 miles SE of Queen City Summit on Hwy. 25	14
1452	21	38	7.4 miles SE of Queen City Summit on Hwy. 25	50
1500	20	38	6.8 miles SE of Queen City Summit on Hwy. 25	60
1507	18	38	5.8 miles SE of Queen City Summit on Hwy. 25	100
1511	18	38	5.4 miles SE of Queen City Summit on Hwy. 25	90
1515	17	38	4.9 miles SE of Queen City Summit on Hwy. 25	90
1518	16	38	4.3 miles SE of Queen City Summit on Hwy. 25	100
1520	16	39	3.8 miles SE of Queen City Summit on Hwy. 25	100
1525	15	39	3.3 miles SE of Queen City Summit on Hwy. 25	110
1528	14	39	2.8 miles SE of Queen City Summit on Hwy. 25	115
1531	14	39	2.4 miles SE of Queen City Summit on Hwy. 25	100
1534	13	39	1.8 miles SE of Queen City Summit on Hwy. 25	115
1536	12	39	1.3 miles SE of Queen City Summit on Hwy. 25	115
1540	12	39	1.3 miles SE of Queen City Summit on Hwy. 25	95
1544	11	40	0.4 miles SE of Queen City Summit on Hwy. 25	110
2057	21	38	7.6 miles SE of Queen City Summit on Hwy. 25	4
1030	32	36	Tempiute	0
1045	32	36	Tempiute	0
1110	32	36	Tempiute	0
1113	32	36	Tempiute	0
1130	32	36	Tempiute	0

Note: c = These readings have been corrected to eliminate that part of the reading due to contamination.

Table II
Ground Monitoring Results - July 6, 1962
Project Sedan

Area 2

TIME	AZIMUTH, DEGREES	DISTANCE, MILES	LOCATION	NET GAMMA mr/hr
<u>QUEEN CITY SUMMIT, PENOYER, TEMPIUTE, AND HANCOCK SUMMIT AREA (CONT'D)</u>				
1145	32	36	Tempiute	0.12
1146	32	36	Tempiute	0.5
1147	32	36	Tempiute	0.4
1149	32	36	Tempiute	0.3
1151	32	36	Tempiute	0.3
1155	32	36	Tempiute	0.7
1200	32	36	Tempiute	0.4
1210	32	36	Tempiute	0.2
1215	32	36	Tempiute	0.3
1220	32	36	Tempiute	0.3
1230	32	36	Tempiute	0.2
1245	32	36	Tempiute	0.3
1340	32	36	Tempiute	0.6
1350	32	36	Tempiute	0.5
1355	32	36	Tempiute	0.8
1400	32	36	Tempiute	1.0
1107	22	37	Penoyer	0 ^c
1123	22	37	Penoyer	0.11 ^c
1124	22	37	Penoyer	0.4 ^c
1125	22	37	Penoyer	1.5 ^c
1127	22	37	Penoyer	2 ^c
1129	22	37	Penoyer	4 ^c
1132	22	37	Penoyer	5 ^c
1137	22	37	Penoyer	18 ^c
1138	22	37	Penoyer	30 ^c
1140	22	37	Penoyer	20 ^c
1142	22	37	Penoyer	20 ^c
1144	22	37	Penoyer	21 ^c
1147	22	37	Penoyer	21 ^c
1150	22	37	Penoyer	31 ^c
1152	22	37	Penoyer	32 ^c
1102	59	41	Hancock Summit	0 ^c
1300	59	41	Hancock Summit	0 ^c
1407	59	41	Hancock Summit	0 ^c
2015	59	41	Hancock Summit	0 ^c

Note: c = These readings have been corrected to eliminate that part of the reading due to contamination.

Table II
Ground Monitoring Results - July 6, 1962
Project Sedan

Area 3

TIME	AZIMUTH, DEGREES	DISTANCE, MILES	LOCATION	NET GAMMA mr/hr
<u>DIABLO AND QUINN WELL AREA</u>				
1228	5	42	12.0 miles south of Diablo on Hwy. 25	300 ^c
1232	3	44	9.8 miles south of Diablo on Hwy. 25	320 ^c
1234	1	45	8.6 miles south of Diablo on Hwy. 25	410 ^c
1237	360	47	5.6 miles south of Diablo on Hwy. 25	310 ^c
1240	359	49	3.6 miles south of Diablo on Hwy. 25	170 ^c
1247	359	53	Diablo	210 ^c
1252	359	55	2.5 miles north of Diablo on Hwy. 25	220 ^c
1254	359	57	5.1 miles north of Diablo on Hwy. 25	170 ^c
1257	359	61	7.9 miles north of Diablo on Hwy. 25	140 ^c
1259	359	63	10.9 miles north of Diablo on Hwy. 25	140 ^c
1300	3	64	Quinn Well	0 ^c
1305	3	64	Quinn Well	0.6 ^c
1308	3	64	Quinn Well	1.0 ^c
1312	3	64	Quinn Well	3.0 ^c
1319	357	68	8.0 miles NW of Quinn Well (Jct. with Hwy. 25)	1.0 ^c
1455	355	43	10.6 miles south of Diablo on road to Reed	33 ^c
1500	355	45	9.2 miles south of Diablo on road to Reed	48 ^c
1503	356	46	8.0 miles south of Diablo on road to Reed	63 ^c
1518	356	49	4.9 miles south of Diablo on road to Reed	58 ^c
1527	359	53	0.5 miles due west of Diablo	40 ^c
1537	359	55	2.3 miles north of Diablo	40 ^c
1540	359	56	3.1 miles north of Diablo on Hwy. 25	60 ^c
1545	359	59	7.1 miles north of Diablo on Hwy. 25	33 ^c
1553	359	64	12.1 miles north of Diablo on Hwy. 25	16 ^c
1555	4	43	11.8 miles south of Diablo on Hwy. 25	95
1610	3	43	10.3 miles south of Diablo on Hwy. 25	100
1612	3	44	9.8 miles south of Diablo on Hwy. 25	100
1615	2	44	9.2 miles south of Diablo on Hwy. 25	100
1618	2	44	8.7 miles south of Diablo on Hwy. 25	75
1622	1	45	8.1 miles south of Diablo on Hwy. 25	80
1626	1	46	7.3 miles south of Diablo on Hwy. 25	60
1629	360	46	6.6 miles south of Diablo on Hwy. 25	70
1633	360	47	5.8 miles south of Diablo on Hwy. 25	65
1635	359	48	4.9 miles south of Diablo on Hwy. 25	60
1638	359	48	4.3 miles south of Diablo on Hwy. 25	60
1642	359	49	3.6 miles south of Diablo on Hwy. 25	65
1645	359	50	2.8 miles south of Diablo on Hwy. 25	60
1648	359	51	2.2 miles south of Diablo on Hwy. 25	60
1650	359	52	1.2 miles south of Diablo on Hwy. 25	60
2010	359	56	3.1 miles north of Diablo on Hwy. 25	28 ^c
2018	359	53	Diablo	26 ^c

Note: c = These readings have been corrected to eliminate that part of the reading due to contamination.

Table II
Ground Monitoring Results - July 6, 1962
Project Sedan

Area 3

TIME	AZIMUTH, DEGREES	DISTANCE, MILES	LOCATION	NET GAMMA mr/hr
DIABLO AND QUINN WELL AREA (CONT'D)				
1018	359	53	Diablo	0 ^c
1219	359	53	Diablo	0 ^c
1221	359	53	Diablo	0.21 ^c
1223	359	53	Diablo	0.36 ^c
1225	359	53	Diablo	0.46 ^c
1227	359	53	Diablo	0.66 ^c
1229	359	53	Diablo	1.3 ^c
1230	359	53	Diablo	7.5 ^c
1231	359	53	Diablo	8.1 ^c
1233	359	53	Diablo	8.6 ^c
1234	359	53	Diablo	9.1 ^c
1235	359	53	Diablo	10.7 ^c
1237	359	53	Diablo	12 ^c
1239	359	53	Diablo	18 ^c
1240	359	53	Diablo	30 ^c
1243	359	53	Diablo	50 ^c
1245	359	53	Diablo	72 ^c
1247	359	53	Diablo	72 ^c
1250	359	53	Diablo	129 ^c
1252	359	53	Diablo	210 ^c
1253	359	53	Diablo	210 ^c
1255	359	53	Diablo	210 ^c
1257	359	53	Diablo	250 ^c
1300	359	53	Diablo	288 ^c
1301	359	53	Diablo	288 ^c
1302	359	53	Diablo	324 ^c
1303	359	53	Diablo	324 ^c
1306	359	53	Diablo	305 ^c
1309	359	53	Diablo	269 ^c
1314	359	53	Diablo	230 ^c
1321	359	53	Diablo	210 ^c
1322	359	53	Diablo	192 ^c
1327	359	53	Diablo	172 ^c
1330	359	53	Diablo	172 ^c
1333	359	53	Diablo	155 ^c
1339	359	53	Diablo	129 ^c
1359	359	53	Diablo	100 ^c
1408	359	53	Diablo	83 ^c
1412	359	53	Diablo	72 ^c
1425	359	53	Diablo	67 ^c
1437	359	53	Diablo	67 ^c
1444	359	53	Diablo	56 ^c
1455	359	53	Diablo	67 ^c

Note: c = These readings have been corrected to eliminate that part of the reading due to contamination.

Table II
Ground Monitoring Results - July 6, 1962
Project Sedan

Area 3

TIME	AZIMUTH, DEGREES	DISTANCE, MILES	LOCATION	NET GAMMA mr/hr
<u>DIABLO AND QUINN WELL AREA (CONT'D)</u>				
1505	359	53	Diablo	61 ^c
1512	359	53	Diablo	61 ^c
1518	359	53	Diablo	56 ^c
1525	359	53	Diablo	60 ^c
1530	359	53	Diablo	56 ^c
1536	359	53	Diablo	56 ^c
1541	359	53	Diablo	52 ^c
1548	359	53	Diablo	52 ^c
1600	359	53	Diablo	52 ^c
1615	359	53	Diablo	50 ^c
1630	359	53	Diablo	49 ^c
1650	359	53	Diablo	40 ^c
1703	359	53	Diablo	40 ^c
1717	359	53	Diablo	36 ^c
1730	359	53	Diablo	35 ^c
1746	359	53	Diablo	36 ^c
1801	359	53	Diablo	36 ^c
1816	359	53	Diablo	36 ^c
1830	359	53	Diablo	36 ^c
1850	359	53	Diablo	32 ^c
1902	359	53	Diablo	30 ^c
1920	359	53	Diablo	29 ^c
1930	359	53	Diablo	28 ^c
1946	359	53	Diablo	28 ^c
2018	359	53	Diablo	25.5 ^c

Note: c = These readings have been corrected to eliminate that part of the reading due to contamination.

Table II
Ground Monitoring Results - July 6, 1962
Project Sedan

Area 4

TIME	AZIMUTH, DEGREES	DISTANCE, MILES	LOCATION	NET GAMMA mr/hr
<u>TWIN SPRINGS, WARM SPRINGS, LOCKES, AND CURRANT AREA</u>				
1000	355	72	Twin Springs	0
1100	355	72	Twin Springs	0
1200	355	72	Twin Springs	0
1230	355	72	Twin Springs	0
1245	355	72	Twin Springs	0
1300	355	71	Twin Springs Turnoff ^d	0
1335	355	71	Twin Springs Turnoff ^d	0.03
1345	355	71	Twin Springs Turnoff ^d	0.03
1350	356	70	3.0 miles SE of Twin Springs Turnoff	3.5
1405	355	71	Twin Springs Turnoff ^d	20
1408	355	71	Twin Springs Turnoff ^d	45
1409	355	71	Twin Springs Turnoff ^d	50
1410	355	71	Twin Springs Turnoff ^d	60
1412	355	71	Twin Springs Turnoff ^d	65
1413	355	71	Twin Springs Turnoff ^d	68
1414	355	71	Twin Springs Turnoff ^d	90
1415	355	71	Twin Springs Turnoff ^d	95
1418	355	72	Twin Springs	30
1420	355	71	Twin Springs Turnoff ^d	100
1422	355	72	Twin Springs	18
1430	355	72	Twin Springs	8
1440	355	72	Twin Springs	6
1445	355	71	Twin Springs Turnoff ^d	14 ^c
1450	355	71	Twin Springs Turnoff ^d	10 ^c
1512	355	72	Twin Springs	2 ^c
1525	355	71	Twin Springs Turnoff ^d	2 ^c
1535	355	71	Twin Springs Turnoff ^d	2 ^c
1600	355	71	Twin Springs Turnoff ^d	2 ^c
1430	355	72	1.0 mile west of Twin Springs Turnoff	12.9 ^c
1435	353	73	2.0 miles west of Twin Springs Turnoff	2.4 ^c
1440	352	73	3.0 miles west of Twin Springs Turnoff	1.9 ^c
1440	351	73	4.0 miles west of Twin Springs Turnoff	0.8 ^c
1445	351	73	5.0 miles west of Twin Springs Turnoff	0.3 ^c
1447	350	73	6.0 miles west of Twin Springs Turnoff	0.3 ^c
1450	349	73	7.0 miles west of Twin Springs Turnoff	0.3 ^c
1455	348	73	8.0 miles west of Twin Springs Turnoff	0.35 ^c
1458	348	73	9.0 miles west of Twin Springs Turnoff	0.3 ^c
1500	347	74	Warm Springs	0.4 ^c
1510	348	75	2.0 miles north of Warm Springs on Hwy.6	0.1 ^c
1514	349	77	4.0 miles north of Warm Springs on Hwy.6	0.01 ^c

Notes: c = These readings have been corrected to eliminate that part of the reading due to contamination.

d = Twin Springs Turnoff is one mile SE of Twin Springs at Highway 25.

Table II
Ground Monitoring Results - July 6, 1962
Project Sedan

Area 4

TIME	AZIMUTH, DEGREES	DISTANCE, MILES	LOCATION	NET GAMMA mr/hr
TWIN SPRINGS, WARM SPRINGS, LOCKES, AND CURRANT AREA (CONT'D)				
1517	350	78	6.0 miles north of Warm Springs on Hwy. 6	0.01 ^c
1520	351	79	8.0 miles north of Warm Springs on Hwy. 6	0.01 ^c
1523	352	81	10.0 miles north of Warm Springs on Hwy. 6	0 ^c
1526	352	83	12.0 miles north of Warm Springs on Hwy. 6	0.02 ^c
1530	353	84	14.0 miles north of Warm Springs on Hwy. 6	0.02 ^c
1533	354	86	16.0 miles north of Warm Springs on Hwy. 6	0.02 ^c
1536	355	88	18.0 miles north of Warm Springs on Hwy. 6	0.04 ^c
1538	356	89	20.0 miles north of Warm Springs on Hwy. 6	0.04 ^c
1542	356	90	Rattlesnake	0.22 ^c
1600	356	90	1.0 mile NE of Rattlesnake on Hwy. 6	0.22 ^c
1603	358	91	3.0 miles NE of Rattlesnake on Hwy. 6	0.5 ^c
1606	359	92	5.0 miles NE of Rattlesnake on Hwy. 6	0.9 ^c
1610	360	92	7.0 miles NE of Rattlesnake on Hwy. 6	1.9 ^c
1613	1	91	9.0 miles NE of Rattlesnake on Hwy. 6	4.8 ^c
1618	2	90	13.4 miles SW of Lockes on Hwy. 6	6.9 ^c
1623	3	91	11.4 miles SW of Lockes on Hwy. 6	6.9 ^c
1628	4	93	9.4 miles SW of Lockes on Hwy. 6	7.4 ^c
1632	5	94	7.4 miles SW of Lockes on Hwy. 6	5.9 ^c
1655	6	95	5.4 miles SW of Lockes on Hwy. 6	2.9 ^c
1658	7	96	3.4 miles SW of Lockes on Hwy. 6	3.9 ^c
1700	8	97	1.4 miles SW of Lockes on Hwy. 6	1.9 ^c
1704	8	98	Lockes	1.9 ^c
1745	7	96	2.5 miles SW of Lockes on Hwy. 6	2.9 ^c
1820	356	90	Rattlesnake	0.2 ^c
1830	354	85	6.0 miles south of Rattlesnake on Hwy. 6	0.2 ^c
1300	8	98	Lockes	0 ^c c
1325	8	98	Lockes	0 ^c
1440	4	93	9.0 miles SW of Lockes on Hwy. 6	0.14 ^c
1450	7	96	3.0 miles SW of Lockes on Hwy. 6	0.09 ^c
1500	8	98	Lockes	0.08 ^c
1515	8	98	Lockes	3.0 ^c
1525	8	97	1.2 miles SW of Lockes on Hwy. 6	3.4 ^c
1530	7	96	2.6 miles SW of Lockes on Hwy. 6	4.2 ^c
1545	7	96	2.6 miles SW of Lockes on Hwy. 6	4.2 ^c
1600	7	96	2.6 miles SW of Lockes on Hwy. 6	4.1 ^c
1615	7	96	2.6 miles SW of Lockes on Hwy. 6	3.1 ^c
1620	15	113	Currant	1
1627	7	96	2.6 miles SW of Lockes on Hwy. 6	2.9 ^c
1635	15	113	Currant	1
1640	15	113	Currant	4
1645	7	96	2.6 miles SW of Lockes on Hwy. 6	2.6 ^c

Note: c = These readings have been corrected to eliminate that part of the reading due to contamination.

Table II
Ground Monitoring Results - July 6, 1962
Project Sedan

TIME	AZIMUTH, DEGREES	DISTANCE, MILES	LOCATION	NET GAMMA mr/hr
TWIN SPRINGS, WARM SPRINGS, LOCKES, AND CURRANT AREA (CONT'D)				
1650	15	113	Currant	6
1700	15	111	2.0 miles SW of Currant on Highway 6	9
1705	15	110	3.0 miles SW of Currant on Highway 6	10
1707	14	109	4.0 miles SW of Currant on Highway 6	10
1708	14	108	5.0 miles SW of Currant on Highway 6	9
1709	14	107	6.0 miles SW of Currant on Highway 6	9
1711	14	106	7.0 miles SW of Currant on Highway 6	8
1712	13	105	8.0 miles SW of Currant on Highway 6	7
1713	13	105	9.0 miles SW of Currant on Highway 6	6
1714	13	104	10.0 miles SW of Currant on Highway 6	6
1715	12	103	11.0 miles SW of Currant on Highway 6	5
1715	8	98	Lockes	2.5 ^c
1717	12	103	12.0 miles SW of Currant on Highway 6	4.5
1721	11	101	14.0 miles SW of Currant on Highway 6	4
1722	11	100	15.0 miles SW of Currant on Highway 6	3
1723	10	100	16.0 miles SW of Currant on Highway 6	2.5
1724	10	100	17.0 miles SW of Currant on Highway 6	2.5
1725	9	99	18.0 miles SW of Currant on Highway 6	3
1726	8	99	19.0 miles SW of Currant on Highway 6	3
1730	8	98	Lockes	2
1745	8	98	Lockes	2
1748	9	99	2.0 miles NE of Lockes on Highway 6	2
1750	10	100	3.0 miles NE of Lockes on Highway 6	1.5
1751	10	100	4.0 miles NE of Lockes on Highway 6	2
1752	11	100	5.0 miles NE of Lockes on Highway 6	1.5
1753	11	100	6.0 miles NE of Lockes on Highway 6	1
1754	11	101	7.0 miles NE of Lockes on Highway 6	1
1755	12	103	8.0 miles NE of Lockes on Highway 6	1
1756	12	103	9.0 miles NE of Lockes on Highway 6	1
1757	12	103	10.0 miles NE of Lockes on Highway 6	1
1758	13	104	11.0 miles NE of Lockes on Highway 6	1
1759	13	105	12.0 miles NE of Lockes on Highway 6	0.5
1800	14	106	13.0 miles NE of Lockes on Highway 6	1
1801	14	107	14.0 miles NE of Lockes on Highway 6	1
1802	14	108	15.0 miles NE of Lockes on Highway 6	1.5
1803	14	109	16.0 miles NE of Lockes on Highway 6	1.5
1805	15	110	17.0 miles NE of Lockes on Highway 6	1.5
1806	15	111	18.0 miles NE of Lockes on Highway 6	1.5
1807	15	112	19.0 miles NE of Lockes on Highway 6	1.5
1809	15	112	20.0 miles NE of Lockes on Highway 6	1.5
1810	15	113	Currant	1

Note: c = These readings have been corrected to eliminate that part of the reading due to contamination.

Table II
Ground Monitoring Results - July 6, 1962
Project Sedan

Area 4

TIME	AZIMUTH, DEGREES	DISTANCE, MILES	LOCATION	NET GAMMA mr/hr
<u>TWIN SPRINGS, WARM SPRINGS, LOCKES, AND CURRANT AREA (CONT'D)</u>				
1811	15	113	1.0 miles NE of Currant on Highway 6	2
1812	16	114	2.0 miles NE of Currant on Highway 6	1.5
1813	16	115	3.0 miles NE of Currant on Highway 6	2
1814	16	116	4.0 miles NE of Currant on Highway 6	2
1815	16	117	5.0 miles NE of Currant on Highway 6	2
1815	7	96	2.6 miles SW of Lockes on Highway 6	1.9
1817	17	118	6.0 miles NE of Currant on Highway 6	1.5
1818	17	118	7.0 miles NE of Currant on Highway 6	1
1819	17	119	8.0 miles NE of Currant on Highway 6	1.5
1820	17	119	Currant Maintenance Station	1.5
1822	18	120	2.0 miles NE of Currant Maintenance Station	1.5
1823	18	120	3.0 miles NE of Currant Maintenance Station	2.5
1824	19	120	4.0 miles NE of Currant Maintenance Station	2.5
1856	19	121	Currant Summit	1.5
1900	20	125	37.0 miles SW of Ely on Highway 6	1.5
1905	20	130	32.0 miles SW of Ely on Highway 6	1.5
1908	20	135	27.0 miles SW of Ely (Gardner Turnoff)	2.5
1915	20	140	22.0 miles SW of Ely on Highway 6	3
1919	20	145	17.0 miles SW of Ely on Highway 6	2.5
1925	21	150	12.0 miles SW of Ely on Highway 6	2.5
1936	22	154	5.0 miles SW of Ely on Highway 6	2
2030	15	113	Currant	1.5

Table II
Ground Monitoring Results - July 6, 1962
Project Sedan

Area 5

TIME	AZIMUTH, DEGREES	DISTANCE, MILES	LOCATION	NET GAMMA mr/hr
<u>BLUE EAGLE RANCH, NYALA, AND ADAVEN AREA</u>				
1500	15	89	Blue Eagle Ranch	0
1503	15	89	Blue Eagle Ranch	0
1515	15	89	Blue Eagle Ranch	0.09
1520	15	89	Blue Eagle Ranch	0.37
1530	15	89	Blue Eagle Ranch	1.0
1534	15	89	Blue Eagle Ranch	3
1540	15	89	Blue Eagle Ranch	5
1550	15	89	Blue Eagle Ranch	6
1610	15	89	Blue Eagle Ranch	6
1620	15	89	Blue Eagle Ranch	5
1640	15	89	Blue Eagle Ranch	5
1700	15	89	Blue Eagle Ranch	3
1330	12	77	Nyala	0
1340	12	77	Nyala	0.02
1350	12	77	Nyala	0.02
1355	12	77	Nyala	0.12
1400	12	77	Nyala	0.47
1405	12	77	Nyala	0.87
1410	12	77	Nyala	0.77
1415	12	77	Nyala	1.7
1420	12	77	Nyala	7
1425	12	77	Nyala	10
1430	12	77	Nyala	12
1435	12	77	Nyala	16
1440	12	77	Nyala	13
(Moved inside house at this time; all succeeding readings are indoors.)				
1445	12	77	Nyala	10
1450	12	77	Nyala	9
1500	12	77	Nyala	10
1515	12	77	Nyala	8
1530	12	77	Nyala	7
1540	12	77	Nyala	4.5
1550	12	77	Nyala	3.5
1600	12	77	Nyala	3.5
1615	12	77	Nyala	3.2
1630	12	77	Nyala	3.0
1645	12	77	Nyala	2.8
1700	12	77	Nyala	2.6
1715	12	77	Nyala	2.6
1730	12	77	Nyala	2.5
1745	12	77	Nyala	2.4

Table II
Ground Monitoring Results - July 6, 1962
Project Sedan

Area 5

TIME	AZIMUTH, DEGREES	DISTANCE, MILES	LOCATION	NET GAMMA mr/hr
<u>BLUE EAGLE RANCH, NYALA, AND ADAVEN AREA (CONT'D)</u>				
1220	17	78	Cherry Creek Summit	0
1230	17	78	Cherry Creek Summit	0
1320	20	71	Adaven	0.4
1325	21	71	1.0 mile east of Adaven	1.2
1328	22	69	Uhalde Ranch	1.4
1332	22	69	Uhalde Ranch	3.2
1335	22	68	1.0 mile south of Uhalde Ranch	4.9
1337	22	68	1.9 mile south of Uhalde Ranch	6.0
1340	22	67	2.8 miles south of Uhalde Ranch	3.0
1343	22	65	4.7 miles south of Uhalde Ranch	1.8
1350	22	64	5.9 miles south of Uhalde Ranch	4.6
1357	20	62	Pine Creek Ranch	6.0
1400	20	62	Pine Creek Ranch	6.0
1405	20	62	Pine Creek Ranch	5.5
1409	20	62	Pine Creek Ranch	8
1413	20	62	Pine Creek Ranch	9
1414	20	62	Pine Creek Ranch	10
1415	20	62	Pine Creek Ranch	11
1417	20	62	Pine Creek Ranch	12
1420	20	62	Pine Creek Ranch	12
1423	20	62	Pine Creek Ranch	10
1425	20	62	Pine Creek Ranch	6
1427	20	62	Pine Creek Ranch	9
1432	20	62	Pine Creek Ranch	10
1435	20	62	Pine Creek Ranch	12
1440	20	62	Pine Creek Ranch	10
1447	20	62	Pine Creek Ranch	12
1450	20	62	Pine Creek Ranch	10
1455	20	62	Pine Creek Ranch	9
1500	20	62	Pine Creek Ranch	7
1508	20	62	Pine Creek Ranch	6
1520	20	62	Pine Creek Ranch	6
1530	20	62	Pine Creek Ranch	5
1545	20	62	9.6 miles south of Uhalde Ranch	5
1608	20	62	8.0 miles south of Uhalde Ranch	3.8
1618	22	68	1.6 miles south of Uhalde Ranch	3
1623	22	69	Uhalde Ranch	4
1630	20	71	Adaven	4
1705	17	78	Cherry Creek Summit	4
1735	15	79	Casey Ranch	4
1830	15	79	Casey Ranch	2.5

Table II
Ground Monitoring Results - July 6, 1962
Project Sedan

TIME	AZIMUTH, DEGREES	DISTANCE, MILES	LOCATION	NET GAMMA mr/hr
<u>SUNNYSIDE, LUND, AND MOON RIVER RANCH AREA</u>				
1455	28	97	0.7 miles west of Moon River Ranch	0.08 ^c
1459	28	97	1.0 miles west of Moon River Ranch	0.28 ^c
1505	28	96	1.5 miles west of Moon River Ranch	0.38 ^c
1509	28	96	1.5 miles west of Moon River Ranch	0.78 ^c
1515	28	96	1.5 miles west of Moon River Ranch	0.78 ^c
1520	28	96	1.5 miles west of Moon River Ranch	0.58 ^c
1525	28	96	1.5 miles west of Moon River Ranch	0.58 ^c
1530	28	96	1.5 miles west of Moon River Ranch	0.73 ^c
1535	28	96	1.5 miles west of Moon River Ranch	1.6 ^c
1540	28	96	1.5 miles west of Moon River Ranch	1.6 ^c
1545	28	96	1.5 miles west of Moon River Ranch	1.8 ^c
1553	29	97	Moon River Ranch	1.7 ^c
1600	29	97	Moon River Ranch	1.7 ^c
1605	29	97	Moon River Ranch	2.6 ^c
1610	29	97	Moon River Ranch	1.6 ^c
1620	29	97	Moon River Ranch	1.6 ^c
1630	29	97	Moon River Ranch	1.2 ^c
1640	29	97	Moon River Ranch	1.6 ^c
1650	29	97	Moon River Ranch	2.1 ^c
1700	29	97	Moon River Ranch	1.6 ^c
1710	29	97	Moon River Ranch	2.6 ^c
1720	29	97	Moon River Ranch	1.6 ^c
1730	29	97	Moon River Ranch	1.6 ^c
1740	29	97	Moon River Ranch	1.5 ^c
1750	29	97	Moon River Ranch	1.5 ^c
1800	29	97	Moon River Ranch	1.5 ^c
1810	29	97	Moon River Ranch	1.6 ^c
1820	29	97	Moon River Ranch	1.6 ^c
1830	29	97	Moon River Ranch	1.4 ^c
1840	29	97	Moon River Ranch	1.4 ^c
1900	31	104	Sunnyside	0.8 ^c
1915	34	97	10.0 miles south of Sunnyside	0.2 ^c
1930	37	88	20.0 miles south of Sunnyside	0 ^c
1942	43	85	30.0 miles south of Sunnyside	0 ^c
1955	47	78	40.0 miles south of Sunnyside	0 ^c
0900	25	129	Lund	0
1130	25	129	1.0 mile south of Lund	0
1230	24	131	2.0 miles north of Lund	0
1300	24	131	2.5 miles north of Lund	0
1330	25	129	0.5 miles south of Lund	0
1400	25	129	0.5 miles south of Lund	0
1430	25	129	0.5 miles south of Lund	0

Note: c = These readings have been corrected to eliminate that part of the reading due to contamination.

Table II
Ground Monitoring Results - July 6, 1962
Project Sedan

TIME	AZIMUTH, DEGREES	DISTANCE, MILES	LOCATION	NET GAMMA mr/hr
<u>SUNNYSIDE, LUND, AND MOON RIVER RANCH AREA (CON'T)</u>				
1500	25	129	0.5 miles south of Lund	0
1530	25	129	0.5 miles south of Lund	0
1600	25	129	0.5 miles south of Lund	0
1630	25	129	0.5 miles south of Lund	0.12
1645	25	129	0.5 miles south of Lund	0.14
1655	25	129	0.5 miles south of Lund	0.29
1700	25	129	0.5 miles south of Lund	0.39
1705	25	129	0.5 miles south of Lund	0.49
1710	25	129	0.5 miles south of Lund	0.59
1720	25	129	0.5 miles south of Lund	0.69
1730	25	129	0.5 miles south of Lund	1.0
1740	25	129	0.5 miles south of Lund	1.1
1750	25	129	0.5 miles south of Lund	1.3
1800	25	129	0.5 miles south of Lund	1.6
1810	25	129	0.5 miles south of Lund	2.5
1820	25	129	0.5 miles south of Lund	2.8
1830	25	129	0.5 miles south of Lund	2.6
1840	25	129	Lund	2.2

Instrument used in the Lund vicinity was an Eberline E-500B survey meter.

Table II
Ground Monitoring Results - July 6, 1962
Project Sedan

Area 7

TIME	AZIMUTH, DEGREES	DISTANCE, MILES	LOCATION	NET GAMMA mr/hr
ELY AND MOORMAN RANCH AREA				
1730	13	156	Moorman Ranch	0 ^c
1750	13	156	Moorman Ranch	0.3 ^c
1800	13	156	Moorman Ranch	0.3 ^c
1810	13	156	Moorman Ranch	0.5 ^c
1815	13	156	Moorman Ranch	0.7 ^c
1820	13	156	Moorman Ranch	0.9 ^c
1825	13	156	Moorman Ranch	1.0 ^c
1830	13	156	Moorman Ranch	1.3 ^c
1900	13	156	Moorman Ranch	2.0 ^c
1905	14	158	2.1 miles east of Moorman Ranch	2.0 ^c
1915	13	156	Moorman Ranch	3.0 ^c
1930	13	156	Moorman Ranch	2.9 ^c
1940	13	156	Moorman Ranch	2.0 ^c
1950	13	156	Moorman Ranch	1.6 ^c
2005	8	158	19.1 miles west of Moorman Ranch	1.1 ^c
2020	4	153	El Dorado	0.5 ^c
1730	22	156	East Ely	0 ^c
1850	20	155	Kimberly	0 ^c
1855	20	155	Kimberly	0 ^c
1857	21	155	Ruth	0.6 ^c
1900	21	157	2 miles NE of Ruth	0.7 ^c
1908	23	156	Ely	0.6 ^c
1913	22	156	East Ely	0.8 ^c
1920	22	156	East Ely	0.9 ^c
1930	22	171	McGill	0.7 ^c
1940	22	166	5.0 miles south of McGill	1.1 ^c
1947	22	156	East Ely	1.1 ^c
1955	22	156	East Ely	1.2 ^c
2025	21	157	Junction of Hwys. U.S. 50 and Nev. 44	1.2 ^c
2140	22	156	East Ely	0.7 ^c
0145	22	156	East Ely	0.6 ^c
1910 to 2140	5	255	Elko	0 ^e

Notes: c = These readings have been corrected to eliminate that part of the reading due to contamination.

e = Elko is not shown in Figure I or II. Refer to Figure III in Chapter III.

Table II
Summary of Beta + Gamma Readings - July 6, 1962
Project Sedan

TIME	AZIMUTH, DEGREES	DISTANCE, MILES	LOCATION	NET BETA GAMMA mr/hr
1512	355	72	Twin Springs (on ground)	4.5
1600	355	71	Twin Springs Turnoff (on ground)	4.0
1640	15	89	Blue Eagle Ranch	7.5
1650	15	113	Currant	11
1745	12	77	Nyala	18
2010	359	56	3.1 miles north of Diablo	106
2018	359	53	Diablo	108
2035	11	40	Queen City Summit	121
2057	21	38	7.6 miles SE of Queen City Summit	14

Chapter III

Ground Remonitoring

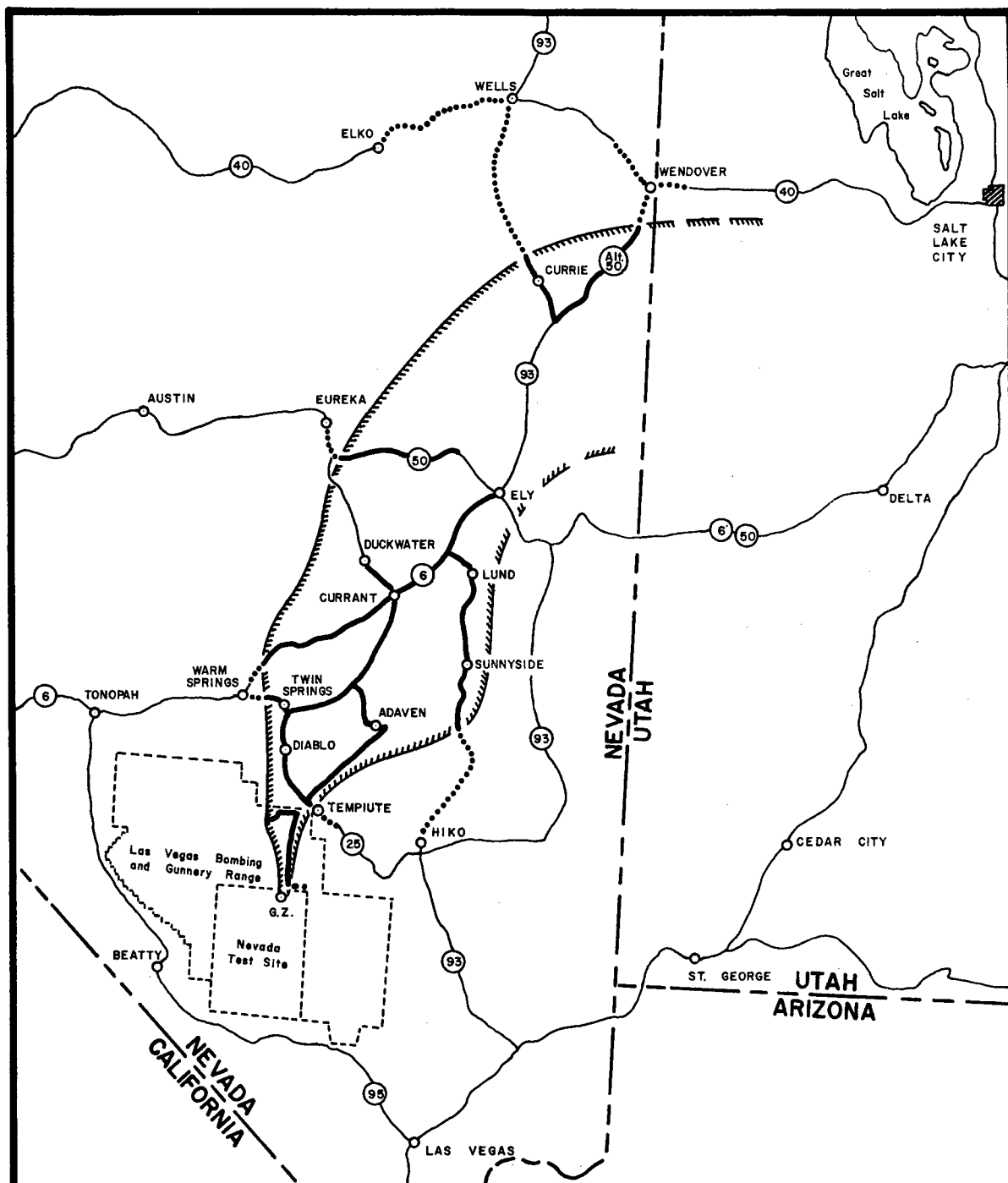
On the days following the Project Sedan event, ground monitors carried out a remonitoring survey to determine the extent of radioactive deposition from the cloud passage. The results of this survey are given in Table III. All readings are three feet above the ground unless otherwise noted.

In addition to the table, Figure III is also given to show the roads remonitored and the area of residual activity thus documented. Due to the small scale of the map, the names of all locations mentioned in Table III could not be shown. Reference to either Figure I or Figure II of Chapter II will show any locations mentioned in the table.

The Project Sedan cloud was last located at Ely on the day of the event. That night, an apparent wind shift carried it in an easterly direction, as shown by ground remonitoring data.

No remonitoring data was obtained on the highway going east from Ely. As a result the southern edge of the activity pattern in that vicinity is not known. An estimated edge is shown on the map.

Remonitoring indicated a small activity rise five miles west of Warm Springs and fifteen miles west of Wendover on July 7th and 8th. This is probably due to local background variations, rather than Project Sedan residual.



-LEGEND-

- ROADS MONITORED WITH POSITIVE RESULTS
- ROADS MONITORED WITH NEGATIVE RESULTS
- ROADS NOT MONITORED
- ===== EDGE OF RESIDUAL ACTIVITY AREA

0 50 100

SCALE OF MILES

EVENT

PROJECT SEDAN

TITLE

OFF-SITE AREA ROADS REMONITORED

DATE OF EVENT

JULY 6, 1962

PLOWSHARE PROGRAM

USPHS RADIOLOGICAL
SAFETY ORGANIZATION

FIGURE

III

TABLE III
GROUND REMONITORING RESULTS - JULY 7, 1962
PROJECT SEDAN

TIME	AZIMUTH, DEGREES	DISTANCE, MILES	LOCATION	NET GAMMA mr/hr	NET BETA GAMMA mr/hr
<u>HIGHWAY 25; WARM SPRINGS TO DIABLO TO COYOTE SUMMIT</u>					
0810	344	73	4.3 miles west of Warm Springs	0 ^f	
0815	347	74	Warm Springs	0	
0828	354	73	9.3 miles east of Warm Springs	0	
0833	355	72	Twin Springs	0.51	
0710	355	72	21.4 miles NW of Diablo on Hwy. 25	1.0	4.0 ^f
0855	355	72	21.0 miles NW of Diablo on Hwy. 25	1.1	
0716	356	70	19.0 miles NW of Diablo on Hwy. 25	4.0	15.5
0915	357	69	16.8 miles NW of Diablo on Hwy. 25	3.6	
0720	357	68	16.0 miles NW of Diablo on Hwy. 25	4.0	16.5
0726	358	65	12.0 miles NW of Diablo on Hwy. 25	6.5	>20
0730	358	62	9.0 miles NW of Diablo on Hwy. 25	8.0	
0735	359	59	6.0 miles NW of Diablo on Hwy. 25	10.0	
0739	359	56	3.0 miles NW of Diablo on Hwy. 25	11.5	
0745	359	53	Diablo	11.0	>50
0814	359	50	3.0 miles SE of Diablo on Hwy. 25	10.0	
0816	360	47	6.0 miles SE of Diablo on Hwy. 25	10.0	
0821	2	44	9.0 miles SE of Diablo on Hwy. 25	18.0	
0827	11	40	Queen City Summit	15.0	
0855	13	39	2.0 miles SE of Queen City Summit	17.0	
0900	17	38	5.0 miles SE of Queen City Summit	10.0	
0905	22	38	8.0 miles SE of Queen City Summit	2.0	6.0
0935	22	37	Penoyer	2.0	9.5
0940	23	37	9.0 miles SE of Queen City Summit	1.0	3.5
0947	24	37	10.0 miles SE of Queen City Summit	0.3	1.5
0950	31	36	14.2 miles SE of Queen City Summit	0	0
1006	37	35	Coyote Summit	0	0 ^f
0930	32	36	Tempiute	1.8	
1333	359	53	Diablo	10 ^f	
<u>HIGHWAY 25 to NYALA TO ADAVEN TO HIGHWAY 25</u>					
0915	357	68	Jct. of Hwy. 25 & Nyala Road - 22.0 miles SW of Nyala	3.3	11.3
1245	357	68	Jct. of Hwy. 25 & Nyala Road - 22.0 miles SW of Nyala	3.5	
0921	1	69	17.0 miles SW of Nyala	2.3	8.0
1455	2	69	16.0 miles SW of Nyala	2.0 ^g	
1453	2	70	15.0 miles SW of Nyala	1.7 ^g	
0932	5	70	12.0 miles SW of Nyala	2.2	7.7
1448	6	70	10.0 miles SW of Nyala	0.9 ^g	
1445	7	72	8.0 miles SW of Nyala	1.1 ^g	

Notes: f = These figures for HWY. 25 have been corrected for instrument contamination.
 Readings are from a Beckman MX-5 survey meter.
 g = These are Beckman MX-5 readings. All other readings in this section are
 Eberline E-500B survey meter readings.

Table III
Ground Remonitoring Results - July 7, 1962
Project Sedan

TIME	AZIMUTH, DEGREES	DISTANCE, MILES	LOCATION	NET GAMMA mr/hr	NET BETA GAMMA mr/hr
<u>HIGHWAY 25 to NYALA TO ADAVEN TO HIGHWAY 25 (CONT'D)</u>					
0940	8	73	7.0 miles SW of Nyala	2.6	7.5
1442	9	73	5.0 miles SW of Nyala	1.5g	
1440	10	74	4.0 miles SW of Nyala	1.2g	
0947	11	76	2.0 miles SW of Nyala	3.3	5.5
1431	12	76	1.0 mile SW of Nyala	1.0g	2.3
1431	12	76	1.0 mile SW of Nyala (on ground)		4.0
0957	12	77	Nyala	2.3	4.5
1425	12	77	Nyala	0.7g	
1409	13	80	4.0 miles north of Nyala	0.9g	
1008	14	80	5.0 miles north of Nyala	2.0	
1020	15	79	Casey Ranch	1.8	2.8
1043	17	79	5.0 miles east of Casey Ranch	2.2	3.5
1047	17	78	Cherry Creek Summit	1.8	3.0
1117	20	71	Adaven	1.5	2.5
1113	22	69	Uhalde Ranch	1.5	2.0
1200	22	65	5.0 miles south of Uhalde Ranch	1.0	1.8
1210	20	62	Pine Creek Ranch	1.0	1.8
1235	20	61	25.1 miles NE of Hwy.25, Penoyer turnoff (0.9 miles SW of Pine Creek Ranch)	1.0	2.0
1244	22	55	20.1 miles NE of Hwy.25, Penoyer turnoff	1.2	2.0
1255	23	48	13.8 miles NE of Hwy.25, Penoyer turnoff	3.0	5.0
1300	25	46	12.1 miles NE of Hwy.25, Penoyer turnoff	5.5	10.5
1303	26	44	10.1 miles NE of Hwy.25, Penoyer turnoff	5.5	10.0
1308	27	42	7.6 miles NE of Hwy. 25, Penoyer turnoff	9.0	17.0
1315	29	40	5.1 miles NE of Hwy. 25, Penoyer turnoff	10.8	
1320	30	38	2.6 miles NE of Hwy. 25, Penoyer turnoff	9.0	17.0
1325	32	36	Hwy. 25, Penoyer turnoff	10.0	
<u>DUCKWATER TO NYALA, VIA CURRANT</u>					
(Readings are from a Beckman MX-5 Survey Meter)					
1146	9	120	Duckwater (on ground)		5.0
1157	10	120	2.0 miles SE of Duckwater	0.8	
1200	11	118	5.0 miles SE of Duckwater	1.0	
1202	12	117	7.0 miles SE of Duckwater	0.6	
1205	12	116	9.0 miles SE of Duckwater	0.5	
1256	16	102	10.0 miles S of Currant on Nyala Road	0.7	1.3
1256	16	102	10.0 miles S of Currant on Nyala Rd. (on ground)		3.0
1300	16	100	12.0 miles S of Currant on Nyala Road	0.8	
1303	16	99	13.0 miles S of Currant on Nyala Road	0.7	
1308	16	96	16.0 miles S of Currant on Nyala Road	0.7	
1346	16	93	19.0 miles S of Currant on Nyala Road	0.7	
1353	15	89	24.0 miles S of Currant on Nyala Road	0.7	
1400	14	85	28.0 miles S of Currant on Nyala Road	0.7	
1405	14	82	32.0 miles S of Currant at Cherry Crk. Rd.Jct.	0.7	

Note: g = These are Beckman MX-5 readings. All other readings in this section are Eberline E-500B survey meter readings.

Table III
Ground Remonitoring Results - July 7, 1962
Project Sedan

TIME	AZIMUTH, DEGREES	DISTANCE, MILES	LOCATION	NET GAMMA mr/hr	NET BETA GAMMA mr/hr
HIGHWAY 6: ELY TO WARM SPRINGS					
(Readings are from a Beckman MX-5 Survey Meter)					
0905	23	156	Ely	0.4	1.0
0916	22	156	Jct. Hwy. 6 & 50, west to Ely	0.4	
1127	22	156	Jct. Hwy. 6 & 50, west to Ely	0.4	
0920	22	154	2.0 miles S of Highway 6 & 50 Junction	0.4	
0922	22	154	3.0 miles S of Highway 6 & 50 Junction	0.4	
0923	22	154	4.0 miles S of Highway 6 & 50 Junction	0.5	
0926	21	153	5.0 miles S of Highway 6 & 50 Junction	0.4	
0931	20	150	7.0 miles S of Highway 3 & 50 Junction	0.5	
0935	20	147	10.0 miles S of Highway 6 & 50 Junction	0.4	
0943	20	142	16.0 miles S of Highway 6 & 50 Junction	0.5	
0955	20	139	23.0 miles S of Highway 6 & 50 Junction	0.4	
1010	20	134	28.0 miles S of Highway 6 & 50 Junction	0.4	
1018	20	129	33.0 miles S of Highway 6 & 50 Junction	0.4	
1032	20	125	37.0 miles S of Highway 6 & 50 Junction	0.4	
1050	17	119	41.0 miles S of Hwy. 6&50 Jct. (Currant Maintenance Station)	0.5	
1100	17	118	6.0 miles NE of Currant	0.4	
1105	15	113	Currant	0.7	
1312	15	113	Currant	0.6	
1315	15	111	2.0 miles SW of Currant	0.7	
1318	14	109	4.0 miles SW of Currant	0.9	
1321	14	107	6.0 miles SW of Currant	0.6	
1327	13	105	8.0 miles SW of Currant	0.5	
1330	13	104	10.1 miles SW of Currant	0.8	
1333	12	103	12.2 miles SW of Currant	0.8	
1338	10	100	16.2 miles SW of Currant	0.7	
1344	8	98	Lockes	0.8	
1400	7	95	4.1 miles SW of Lockes	0.9	1.6
1410	5	94	8.1 miles SW of Lockes	1.2	
1417	3	91	12.1 miles SW of Lockes	1.4	
1421	1	91	16.1 miles SW of Lockes	0.5	
1426	359	92	20.1 miles SW of Lockes	0.1	
1430	356	90	24.1 miles SW of Lockes	0.03	
1435	355	88	27.1 miles SW of Lockes	0.12	
1441	353	84	32.1 miles SW of Lockes	0.03	
1448	350	79	38.1 miles SW of Lockes	0	
LUND & SUNNYSIDE AREA					
(Readings are from a Beckman MX-5 Survey Meter)					
0955	20	135	13.0 miles north of Lund	0.75	
1005	22	133	6.0 miles north of Lund	0.75	
1010	25	129	Lund	0.65	
1020	26	123	7.0 miles south of Lund	0.65	
1030	27	114	17.0 miles south of Lund	0.55	
1042	30	107	27.0 miles south of Lund	0.35	

Table III
Ground Remonitoring Results - July 7, 1962
Project Sedan

TIME	AZIMUTH, DEGREES	DISTANCE, MILES	LOCATION	NET GAMMA mr/hr	NET BETA GAMMA mr/hr
<u>LUND & SUNNYSIDE AREA (CONT'D)</u>					
(Readings are from a Beckman MX-5 Survey Meter)					
1050	31	104	Sunnyside	0.25	
1055	32	101	3.0 miles south of Sunnyside	0.25	
1115	34	97	10.0 miles south of Sunnyside	0.15	0.3
1132	37	88	20.0 miles south of Sunnyside	0.03	0.02
1252	43	85	30.0 miles south of Sunnyside	0	0.02
1215	47	78	40.0 miles south of Sunnyside	0.02	0.02
1234	49	68	50.0 miles south of Sunnyside	0	0
1255	51	58	60.0 miles south of Sunnyside	0	0
1320	58	50	70.0 miles south of Sunnyside	0	0
<u>ELKO, WELLS, CURRIE, AND WENDOVER AREA</u>					
(Readings are from a Beckman MX-5 Survey Meter)					
0910	2	163	Eureka	0	
0920	2	158	4.3 miles SE of Eureka	0	
0937	4	153	El Dorado	0.22	
0954	9	157	15.2 miles east of El Dorado	0.42	
1000	10	157	19.8 miles east of El Dorado	0.42	
1015	13	156	Moorman Ranch	0.42	
1040	13	162	6 miles north of Moorman Ranch	0.42	
1109	15	162	24 miles NW of Ely	0.37	
0630- 0830			Elko to Wells to 21 miles south of Wells	0	
0930	13	250	32 miles north of Currie on Highway 93	0	
0945	15	240	22 miles north of Currie on Highway 93	0	
1000	17	234	12 miles north of Currie on Highway 93	0	
1013	18	231	7 miles north of Currie on Highway 93	0.04	
1020	18	229	5 miles north of Currie on Highway 93	0.04	
1035	18	228	3 miles north of Currie on Highway 93	0.03	
1045	19	225	Currie	0.03	
1100	20	224	3 miles south of Currie	0.03	
1130	20	226	2 miles north of Currie	0.03	
1135	18	228	3 miles north of Currie	0.03	
1140	18	229	4 miles north of Currie	0.03	
1145	18	229	5 miles north of Currie	0.03	0.11
1150	18	230	6 miles north of Currie	0.03	0.08
1155	18	231	7 miles north of Currie	0.03	0.06
1200	18	232	8 miles north of Currie	0.03	0.11
1205	17	232	9 miles north of Currie	0.03	0.08
1210	17	233	10 miles north of Currie	0.02	0.06
1340	19	225	Currie	0.03	
1344	20	224	3 miles south of Currie	0.05	
1348	20	223	6 miles south of Currie	0.03	0.06

Table III
Ground Remonitoring Results - July 7, 1962
Project Sedan

TIME	AZIMUTH, DEGREES	DISTANCE, MILES	LOCATION	NET GAMMA mr/hr	NET BETA GAMMA mr/hr
<u>ELKO, WELLS, CURRIE, AND WENDOVER AREA (CONT'D)</u> (Readings are from a Beckman MX-5 Survey Meter)					
1352	21	221	9 miles south of Currie	0.03	0.06
1355	21	218	12 miles south of Currie	0.02	0.04
1400	22	217	Jct. of Hwy. 93 & Alt. 50, south of Currie	0.03	0.03
	23	220	5 miles N of the junction, on Hwy. Alt. 50	0.03	0.06
	23	225	10 miles N of the junction, on Hwy. Alt. 50	0.03	0.06
	23	229	15 miles N of the junction, on Hwy. Alt. 50	0.03	0.06
	23	234	20 miles N of the junction, on Hwy. Alt. 50	0.03	0.04
	24	238	25 miles N of the junction, on Hwy. Alt. 50	0.03	0.04
	24	241	30 miles N of the junction, on Hwy. Alt. 50	0.03	0.04
	25	246	35 miles N of the junction, on Hwy. Alt. 50	0.03	0.04
	25	251	40 miles N of the junction, on Hwy. Alt. 50	0.01	0.05
	24	256	45 miles N of the junction, on Hwy. Alt. 50	0.02	0.02
1600	24	261	50 miles N of the junction, on Hwy. Alt. 50	0	0.01
	24	266	55 miles N of the junction, on Hwy. Alt. 50	0.01	0
	24	270	Wendover	0	0
	25	271	5 miles east of Wendover	0	0
	26	273	9 miles east of Wendover	0	0
	24	270	Wendover	0	0
	23	269	5 miles west of Wendover	0	
	22	272	10 miles west of Wendover	0	
	22	272	11 miles west of Wendover	0.01	
	22	274	15 miles west of Wendover	0.01	
approx. 1730	21	276	20 miles west of Wendover	0	0

Table III
Ground Remonitoring Results - July 8, 1962
Project Sedan

TIME	AZIMUTH, DEGREES	DISTANCE, MILES	LOCATION	NET GAMMA mr/hr	NET BETA GAMMA mr/hr
<u>TONOPAH TO TEMPIUTE, VIA WARM SPRINGS AND DIABLO^h</u>					
1000	315	90	Tonopah	0	
1100	344	73	5 miles west of Warm Springs	0.03	
1400	32	36	Tempiute	0.05	
1415	21	37	8 miles SE of Queen City Summit	0.7	
1425	22	37	Penoyer	0.8	
1450	16	38	4 miles SE of Queen City Summit	4.4	
1455	11	40	Queen City Summit	3.4	
1510	6	42	4 miles NW of Queen City Summit	2.9	
1515	359	48	5 miles SE of Diablo	3.1	
1525	359	53	Diablo	2.9	
1535	359	58	5 miles NW of Diablo	2.5	
1540	358	63	10 miles NW of Diablo	2.2	
1545	357	68	15 miles NW of Diablo	1.0	
1550	356	70	17 miles NW of Diablo	0.9	
1600	355	71	Twin Springs Turnoff	0.3	
1620	355	72	Twin Springs	0.3	
1625	355	72	1 mile west of Twin Springs	0	
1630	352	73	5 miles west of Twin Springs	0	
1635	347	74	Warm Springs	0	
1650	343	73	5 miles west of Warm Springs	0.01	
1655	340	74	10 miles west of Warm Springs	0	

Note: h = All readings in this section are from an Eberline E500-B Survey Meter.

Table III

Ground Remonitoring Results - July 9, 1962
Project Sedan

TIME	AZIMUTH, DEGREES	DISTANCE, MILES	LOCATION	NET GAMMA mr/hr	NET BETA GAMMA mr/hr
<u>HIGHWAY 25: TEMPIUTE TO WARM SPRINGS¹</u>					
1230	32	36	Tempiute	0.05	0.10
1240	21	37	8 miles SE of Queen City Summit	0.53	1.3
1250	16	38	4 miles SE of Queen City Summit	4.0	9.0
1300	11	40	Queen City Summit	4.0	8.0
1310	6	42	4 miles NW of Queen City Summit	4.0	10.0
1345	359	53	Diablo	2.0	6.0
1500	359	56	2.7 miles NW of Diablo	1.7	5.5
1530	355	72	Twin Springs	0.18	0.42
1520	22	37	Penoyer	0.37	
1540	32	36	Tempiute	0	
1545	22	37	9 miles SE of Queen City Summit	0.07	
1552	14	39	3 miles SE of Queen City Summit	1.5	
1559	11	40	Queen City Summit	1.3	
1610	6	42	4 miles NW of Queen City Summit	1.4	
1710	359	53	Diablo	1.0	
1725	358	63	10 miles NW of Diablo	0.9	
1735	356	70	18 miles NW of Diablo	0.5	
1742	355	71	Twin Springs Turnoff	0.12	
1752	355	72	Twin Springs	0.04	
1758	354	73	2 miles west of Twin Springs	0	
1610	347	74	Warm Springs	0	
1115	50	10	23.5 miles south of the Rock House	0	
1130	36	13	14.5 miles south of the Rock House	0.11	0.18
1140	26	18	8.5 miles south of the Rock House	0.33	0.63
1150	18	21	4.5 miles south of the Rock House	7.0	16.0
1200	13	25	Rock House	17.0	80
1210	19	30	6.9 miles north of the Rock House	4.0	10.0
1427	52	10	24 miles south of the Rock House	0	
1432	48	10	18 miles south of the Rock House	0.03	
1438	36	13	14 miles south of the Rock House	0.07	
1445	26	18	9 miles south of the Rock House	0.17	
1500	13	24	1 mile south of the Rock House	12.0	
1502	13	25	Rock House	10.0	
1507	17	29	5 miles north of the Rock House	4.0	
1509	19	30	7 miles north of the Rock House	2.5	
1615	65	16	Groom Lake	0	
1617	65	15	1 mile west of Groom Lake	0	
1629	65	11	5 miles west of Groom Lake	0	

Note: 1 = This section contains Eberline E-500B Survey Meter readings. The readings of individual instruments are listed in separate groups.

Table III
Ground Remonitoring Results - July 9, 1962
Project Sedan

TIME	AZIMUTH, DEGREES	DISTANCE, MILES	LOCATION	NET GAMMA mr/hr	NET BETA GAMMA mr/hr
<u>HIGHWAY 25: TEMPIUTE TO WARM SPRINGS¹ (CONT'D)</u>					
1632	65	10	6 miles west of Groom Lake	0	
1640	65	9	8 miles west of Groom Lake	0	
1643	65	8	31 miles south of the Rock House	0	
1651	65	8	29 miles south of the Rock House	0	
1656	58	9	27 miles south of the Rock House	0.01	
1700	53	9	25 miles south of the Rock House	0.02	
1705	49	9	23 miles south of the Rock House	0.08	
1738	18	30	Valley Road-Belted Peak Road Junction	3.5	
1744	18	30	1 mile west of junction	5.0	
1746	16	30	2 miles west of junction	4.5	
1749	14	30	3 miles west of junction	8.8	
1752	12	29	4 miles west of junction	10.5	
1757	11	29	5 miles west of junction	10.5	
1800	9	29	6 miles west of junction	13.6	
1804	7	29	7 miles west of junction	13.5	
1807	5	29	8 miles west of junction	10.0	
1810	4	29	8.7 miles west of junction	4.5	
1815	2	29	9.7 miles west of junction	4.4	
1818	360	29	10.7 miles west of junction	4.5	
1823	358	29	11.7 miles west of junction	1.0	
1827	356	30	12.7 miles west of junction	0.8	
1829	355	29	13.7 miles west of junction	0.9	
1832	353	28	14.7 miles west of junction	0.6	
1836	351	28	15.7 miles west of junction	0.95	
1840	349	29	16.7 miles west of junction	1.2	
1843	348	29	17.7 miles west of junction	1.55	
1846	345	29	18.7 miles west of junction	1.7	
1849	348	29	19.7 miles west of junction	1.5	
1853	347	29	20.7 miles west of junction	0.48	

Note: 1 = This section contains Eberline E-500B Survey Meter readings. The readings of individual instruments are listed in separate groups.

Table III
Ground Remonitoring Results - July 10, 1962
Project Sedan

TIME	AZIMUTH, DEGREES	DISTANCE, MILES	LOCATION	NET GAMMA mr/hr	NET BETA GAMMA mr/hr
<u>OFF-SITE AREA</u>					
0942	22	37	Penoyer	0.4	0.7
0942	22	37	Penoyer (on ground)	0.5	1.7
0956	11	40	Queen City Summit	1.6	4.5
0956	11	40	Queen City Summit (on ground)	3.0	3.0
1010	359	53	Diablo	1.1	1.9
1010	359	53	Diablo (on ground)	1.4	3.0
1150	32	36	Tempiute	0	
1035	355	72	22 miles NW of Diablo	0.5	
1022	355	71	Twin Springs Turnoff	0.05	
1010	347	74	Warm Springs	0	
1115	355	72	22 miles NW of Diablo at Hwy.25-Nyala Rd.Jct.	0.5	1.2
1130	2	70	7 miles NE of the Junction	0.4	0.95
1145	9	74	17 miles NE of the Junction	0.35	0.8
1150	12	77	Nyala	0.20	0.6
1400	15	79	Casey Ranch	0.35	0.45
1830	20	62	Pine Creek Ranch	0.20	0.35
1315	8	98	Lockes	0.3	
1330	11	102	7 miles NE of Lockes on Highway 6	0.4	
1400	16	102	10 miles south of Currant on Nyala Road	0.35	
1500	16	96	15 miles south of Currant on Nyala Road	0.15	
1600	15	89	Blue Eagle Ranch	0.10	
1730	9	120	Duckwater	0.08	
1830	15	113	Currant	0.10	
1030	22	134	Gardner Ranch	0.03	
1200	17	119	Currant Maintenance Station	0.05	
1230	16	116	4 miles NE of Currant	0.05	
1330	24	129	Lund	0.03	
1430	31	104	Sunnyside	0	

Note: All readings on the tenth were taken with either a Beckman MX-5 Survey Meter or an Eberline E-500B Survey Meter.

Chapter IV

Recorder Chart Data

Reference to Figure VI of Chapter X will show the locations of six Eberline RM-5 radiation recorders used to record cloud passage gamma activity from the Project Sedan event. These continuous recorders have a logarithmic scale recording range from 0.01 mr/hr to 100 mr/hr, and run for a period of twenty-four hours per chart.

The accompanying Figure IV shows reproductions of the chart data obtained from the recorders. These curves should not be used to determine any exposure doses. This information can be found in Chapter VI.

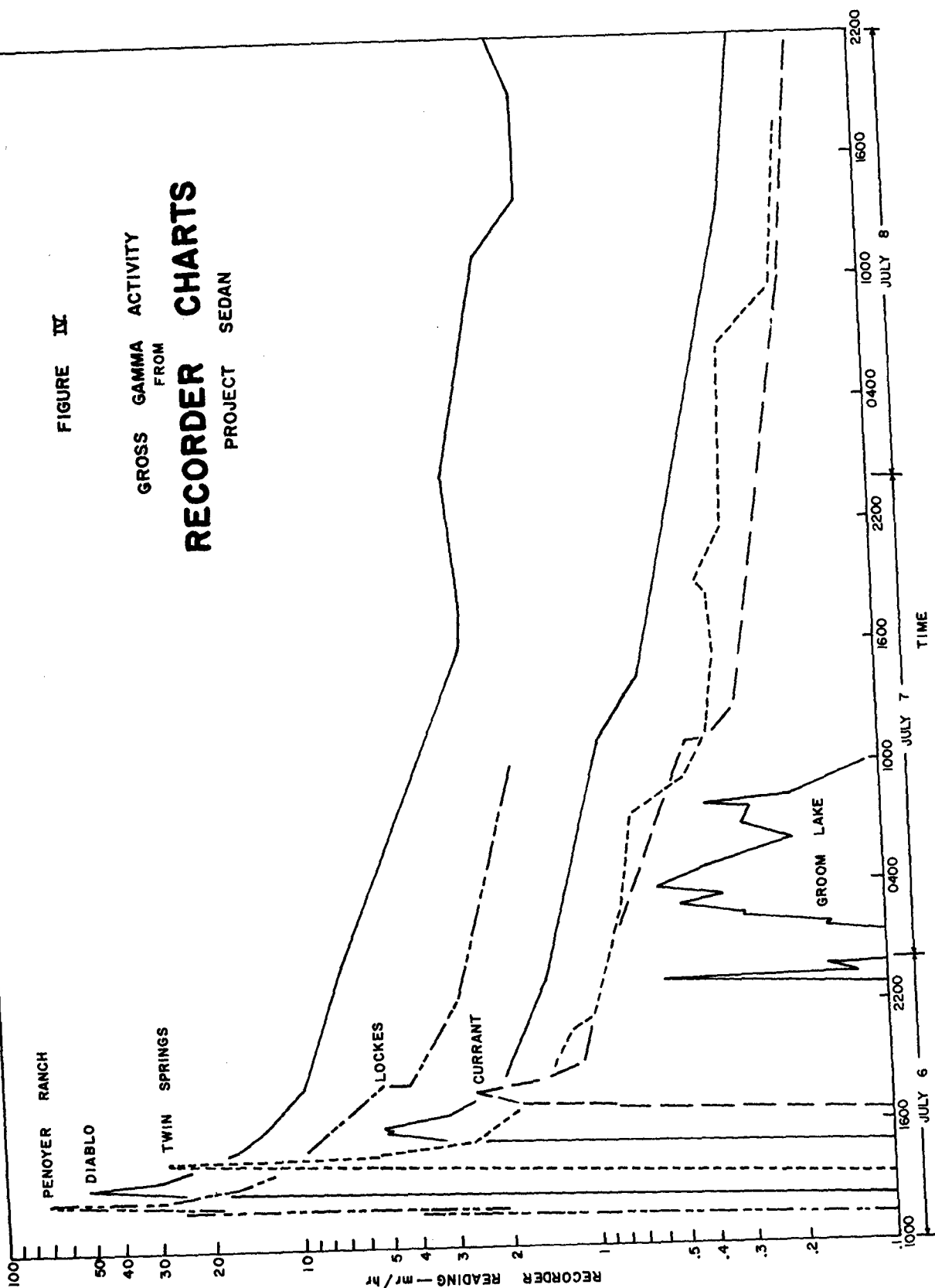
Special note: The recorder at Diablo was reading low by a factor of six. A ground monitor stationed at this location recorded an actual peak reading of 324 mr/hr.

The Diablo and Twin Springs curves in particular indicate slight rises in activity during the nighttime hours. This is theorized as being due to the airborne activity near the surface becoming more concentrated by a type of atmospheric inversion layer. The activity rise indicated at the end of the Diablo curve is due to this effect.

The erratic activity at Groom Lake was due to dust from the Sedan crater being wind borne in that direction overnight.

FIGURE IV

GROSS GAMMA ACTIVITY
FROM
RECORDER CHARTS
PROJECT SEDAN



Chapter V

Safety Measures

In order to keep any radiation exposure to the off-site population at a minimum, several precautionary measures were taken by the Off-Site Radiological Safety Organization during Project Sedan.

With the aid of Nevada State Highway Patrolmen, roadblocks were set up on Highway 25 at Hancock Summit (1102 hours to 1620 hours) and Twin Springs (1130 hours to 1625 hours) during cloud passage. After the cloud had passed Highway 25 and the roadblocks were lifted, a record of each vehicle entering the area of residual radiation was logged and its description passed to the other roadblock via radio. When the vehicle arrived at the next roadblock position, it was monitored for gamma and beta-gamma contamination. Five vehicles were washed with water to reduce the contamination levels on the tires and wheel wells after they had passed through the area. The bodies of these vehicles were contaminated only lightly, and the remainder of the vehicles did not pick up enough contamination to warrant washing.

The gross activities on the five washed vehicles were as follows:

Vehicle #1	150 mr/hr γ	200 mr/hr $\beta+\gamma$	before washing
	40 mr/hr γ	140 mr/hr $\beta+\gamma$	after washing
Vehicle #2	90 mr/hr γ		before washing
	13 mr/hr γ	60 mr/hr $\beta+\gamma$	after washing
Vehicle #3	30 mr/hr γ		before washing
	11 mr/hr γ	38 mr/hr $\beta+\gamma$	after washing
Vehicle #4	17 mr/hr γ		before washing
	8 mr/hr γ	26 mr/hr $\beta+\gamma$	after washing
Vehicle #5	15 mr/hr γ		before washing
	4 mr/hr γ	16 mr/hr $\beta+\gamma$	after washing

In addition to the roadblock measures, the people living at Diablo, Penoyer, and Tempiute were contacted before the event and told of the anticipated release and subsequent activities. Then, on the day of the Project Sedan event, they were relocated during the cloud passage. The Diablo population left from 1145 to 0030 hours, Penoyer from 1000 to 2300 hours, and Tempiute from 1054 to 1620 hours.

Also, the people at Twin Springs, Casey Ranch, Nyala, and Blue Eagle Ranch were asked to remain indoors for the period of cloud passage, as were those at Adaven, Uhalde Ranch, and Pine Creek Ranch. A summary of these measures appears below, and monitor readings at these locations appear in Table II of Chapter II.

Location	Number of Residents	Period Indoors or Relocated
Diablo	4 adults, 4 children	1145 - 0030
Tempiute	3 adults	1000 - 2300
Penoyer	2 adults	1054 - 1620
Twin Springs	10 adults, 2 children	1415 - 1535
Nyala	3 adults, 2 children	1420 - 1800
Casey Ranch	3 adults	1330 - 1735
Blue Eagle Ranch	4 adults, 6 children	1445 - 1615
Adaven	3 adults	1320 - 1630
Uhalde Ranch	2 adults, 3 children	1330 - 1623
Pine Creek Ranch	3 adults, 1 child	1345 - 1700

Chapter VI

Estimated Exposure Doses

The following steps were used to estimate gamma exposure doses to locations that were in the path of the radioactive cloud resulting from the Project Sedan event.

1. Due to the usage of different instruments at different times in the same locations, and because it was impossible to calibrate all instruments immediately prior to use, some discontinuities appear in log-log plots of remonitoring data readings. Therefore, the ground monitoring data and automatic recorder data was combined, and the most reasonable readings plotted on log-log paper.

2. A decay factor was determined from the most reliable curves. These were computed to be:

Diablo $t^{-1.21}$
Lockes $t^{-1.19}$
Nyala $t^{-0.99}$

Penoyer $t^{-1.01}$
Pine Creek Ranch $t^{-1.09}$
Twin Springs $t^{-1.01}$

3. On curves for locations lacking sufficient data, an arbitrary decay factor of $t^{-1.1}$ was used to extend the log-log plot to one hundred hours after zero time (1000 hours, July 6, 1962).

4. With values picked from these log-log plots, an arithmetic plot of the activity at a location was completed. These curves are shown on the following pages and are considered to be most indicative of the actual activities at those locations.

5. The area under these curves was planimetered to obtain the exposure dosage for the first one hundred hours after zero time.

6. An infinite dose from the one hundred hour time was computed using a $t^{-1.2}$ decay factor. The $t^{-1.2}$ factor was used here to provide a conservative decay characteristic.

7. The sum of the curve area exposure and the computed infinite exposure is given herein as the total exposure dose at that location.

In reference to the curves on the following pages:

Only one remonitoring observation was available for Lund, and a log-log plot of this seemed to indicate a too-rapid decay in comparison with other locations. Therefore, the Lund curve has been adjusted to correspond with the others and the exposure from the adjusted curve used. This is represented by the broken line on the plot.

As stated in Chapter V, the people at Diablo, Tempiute, and Penoyer were re-located during cloud passage. The time of resident return is noted on their respective curves.

ALL EXPOSURE RATES SHOWN ARE ABOVE 0.03 mr/hr BACKGROUND.

SUMMARY OF ESTIMATED INFINITE EXPOSURE DOSES

LOCATION	EXPOSURE TO 100 HOURS mr	INFINITE DOSE FROM 100 HOURS mr	TOTAL INFINITE EXPOSURE DOSE mr
Blue Eagle Ranch	63	110	173
Currant	16	30	46
Ely	25	60	85
Lockes	43	50	93
Lund	41	65	106
Moon River Ranch	25	30	55
Moorman Ranch	36	65	101
Nyala	78	100	178
Pine Creek Ranch	63	100	163
Twin Springs	57	65	122

ESTIMATED EXPOSURE DOSES AT RESIDENT RELOCATION POINTS

LOCATION	EXPOSURE TO RESIDENT RETURN	EXPOSURE FROM RESIDENT RETURN TO 100 HOURS	INFINITE DOSE FROM 100 HOURS	TOTAL RESIDENT INFINITE EXPOSURE DOSE
Diablo	610	420	525	945
Penoyer	106	76	150	226
Tempiute	2.5	7	15	22

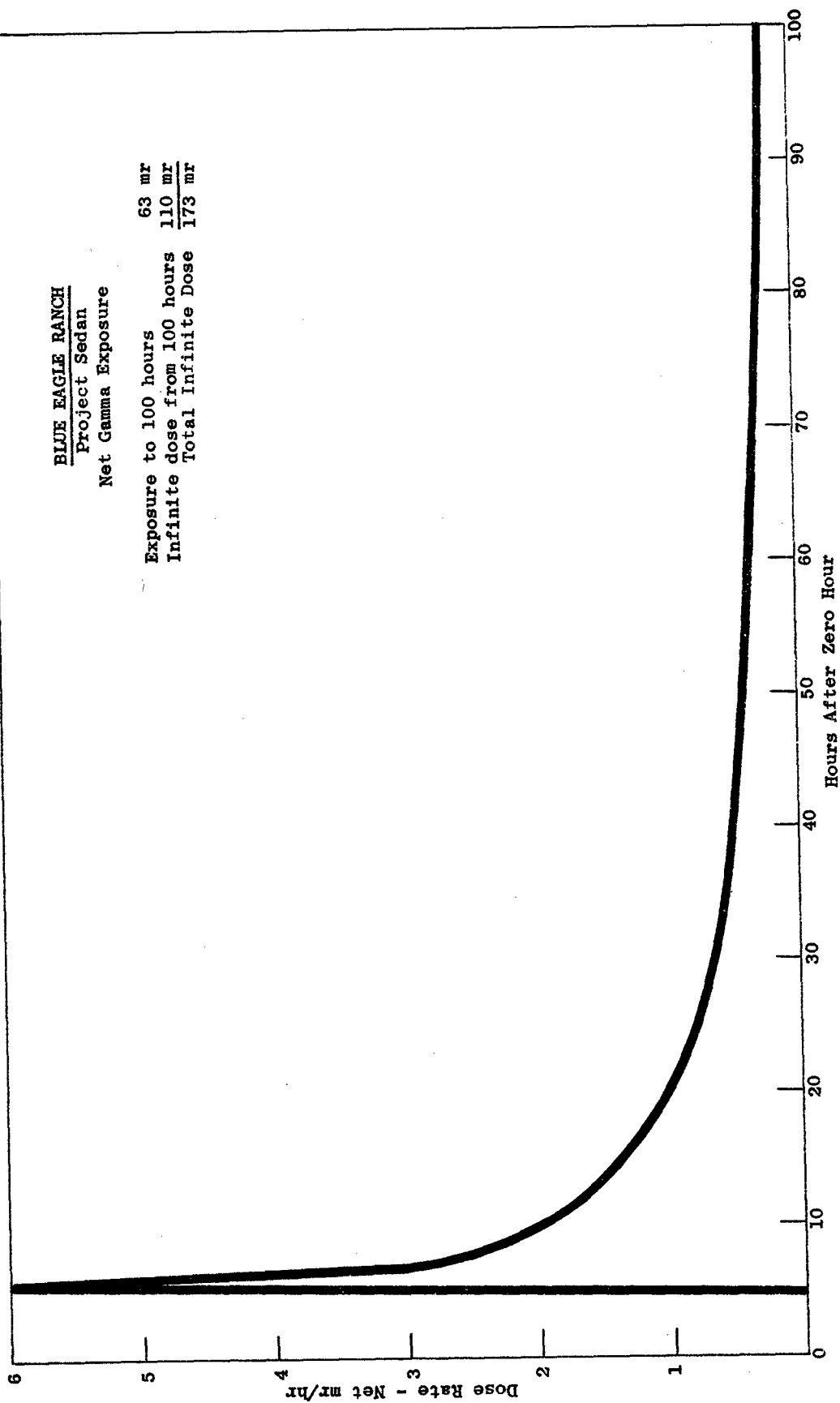
As it was impossible to acquire data at each individual ranch house in the cloud passage area, activity observations were recorded at either one ranch in the close vicinity of others, or the monitor traveled from one house to the other in these ranch groups.

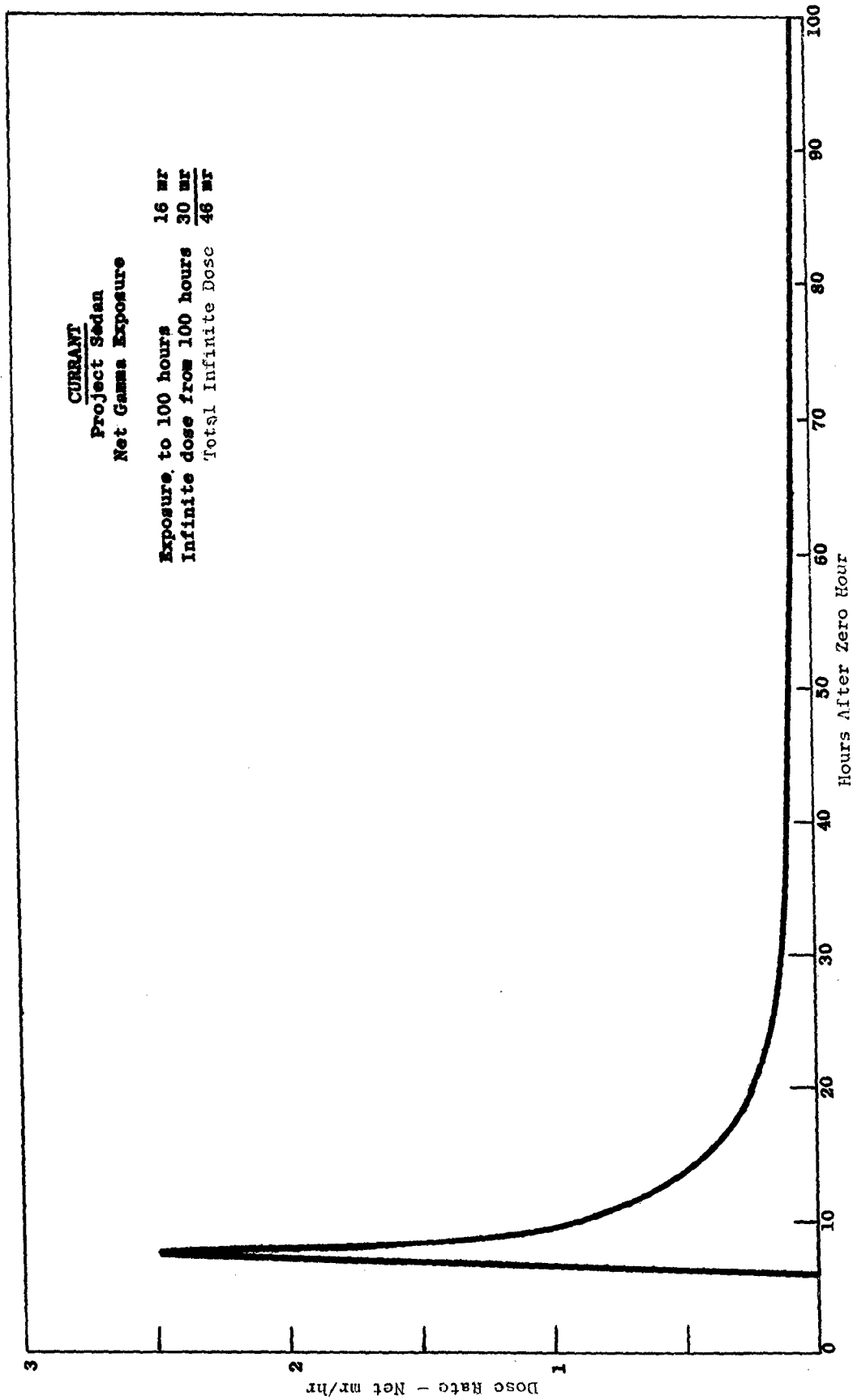
Therefore, no precise exposure data is available for each individual ranch. However, the estimated exposure dose at one location might well be indicative of the exposure at another. For instance, the Pine Creek Ranch exposure might be related to the Adaven and Uhalde Ranch locations; the Nyala to the Casey Ranch; the Lund to the Gardner Ranch; the Currant Maintenance Station to Currant; the Ely to East Ely and Ruth; the Moon River Ranch to Sunnyside.

The reader should also keep in mind that at several of these locations, the residents remained indoors during cloud passage. This would tend to reduce their actual exposure dose. Refer to Chapter V.

BLUE EAGLE RANCH
Project Sedan
 Net Gamma Exposure

Exposure to 100 hours	63 mr
Infinite dose from 100 hours	110 mr
Total Infinite Dose	173 mr



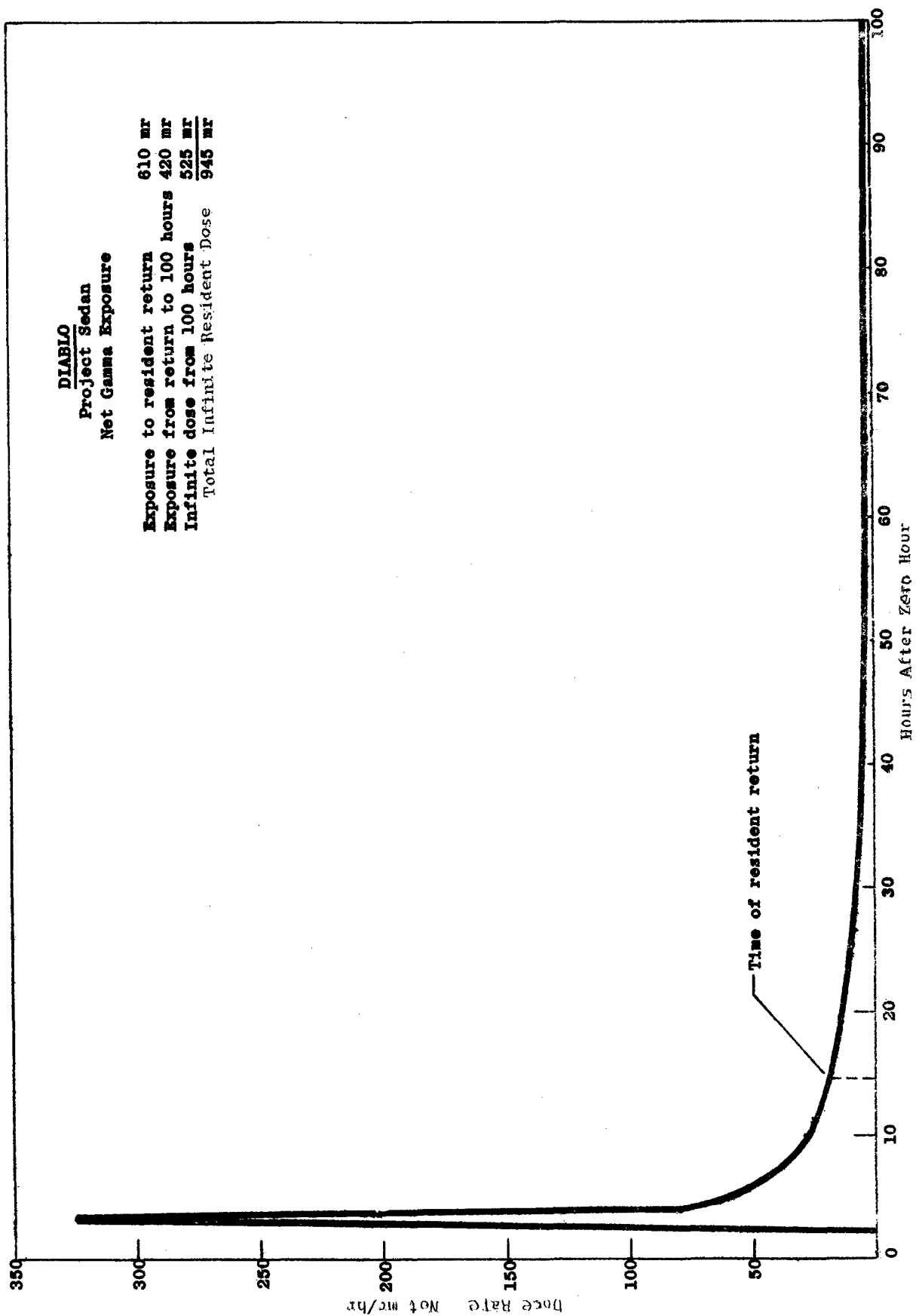


DIABLO

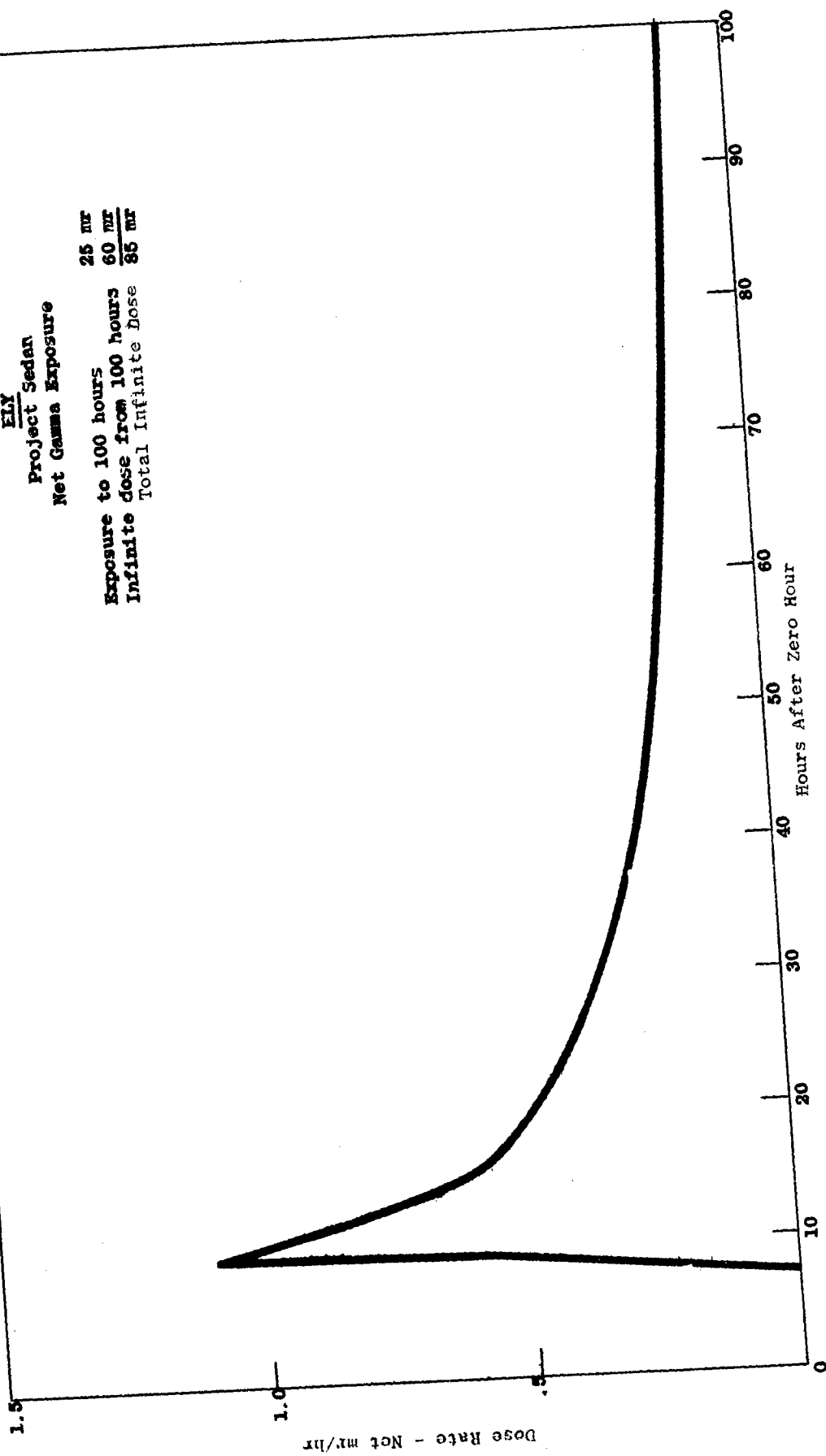
Project Sedan

Net Gamma Exposure

Exposure to resident return	610 mr
Exposure from return to 100 hours	420 mr
Infinite dose from 100 hours	525 mr
Total Infinite Resident Dose	<u>945 mr</u>

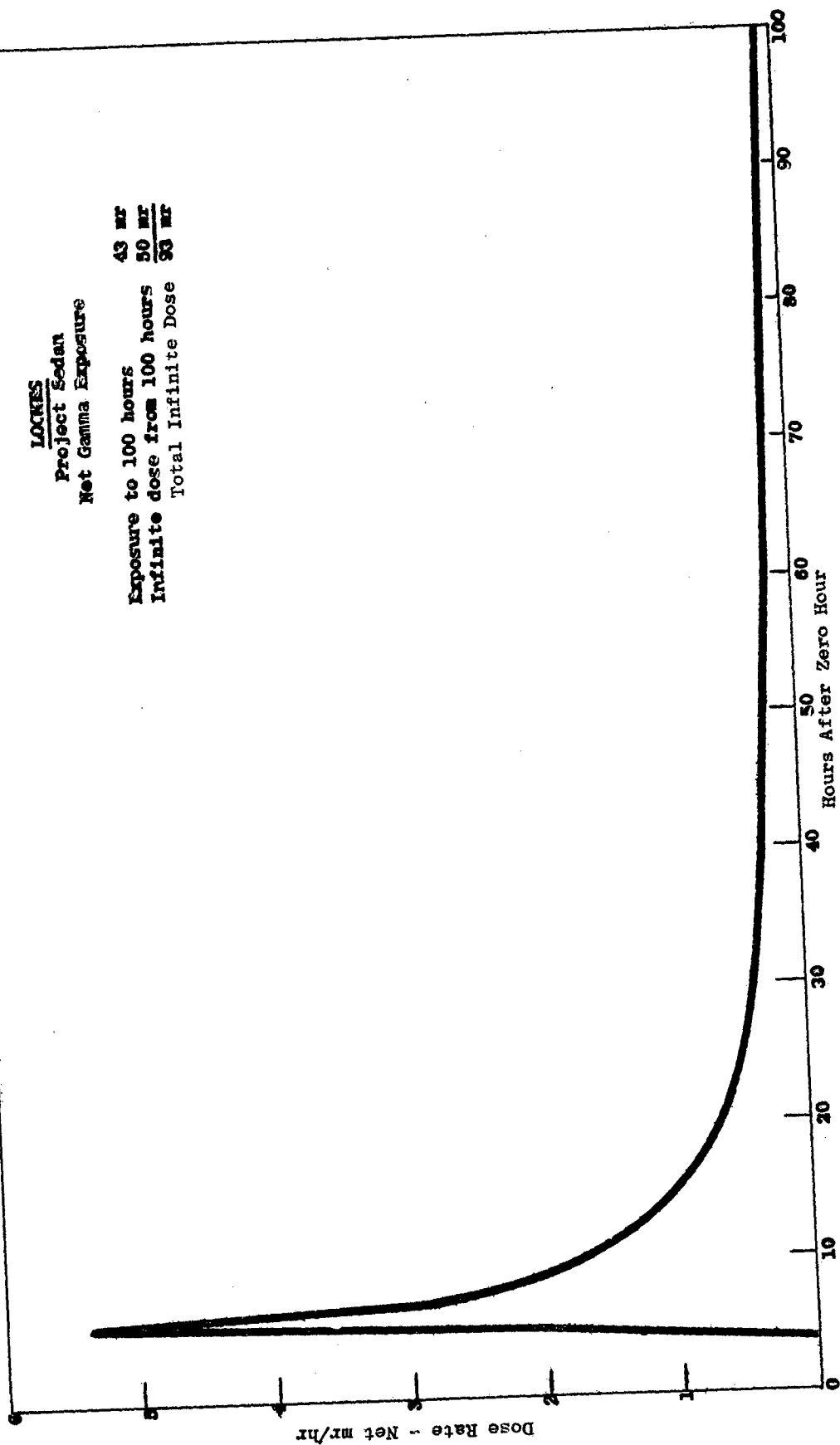


ELY
 Project Sedan
 Net Gamma Exposure
 Exposure to 100 hours 25 mr
 Infinite dose from 100 hours 60 mr
 Total Infinite dose 85 mr



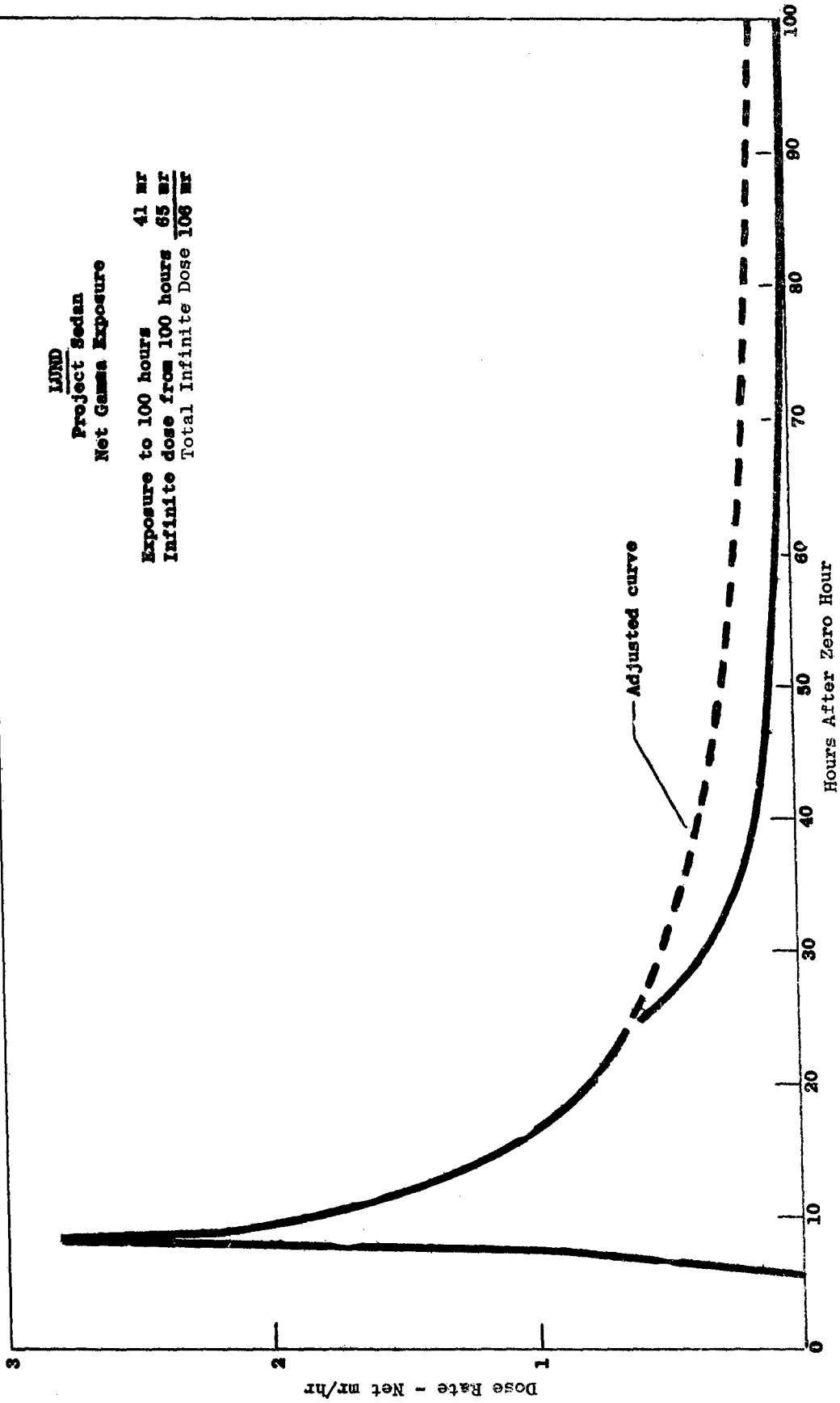
LOCKES
Project Sedan
Net Gamma Exposure

Exposure to 100 hours 43 mr
 Infinite dose from 100 hours 50 mr
 Total Infinite Dose 93 mr



LUND
Project Sedan
Net Gamma Exposure

Exposure to 100 hours 41 mr
Infinite dose from 100 hours 63 mr
Total Infinite Dose 106 mr



MOON RIVER RANCH

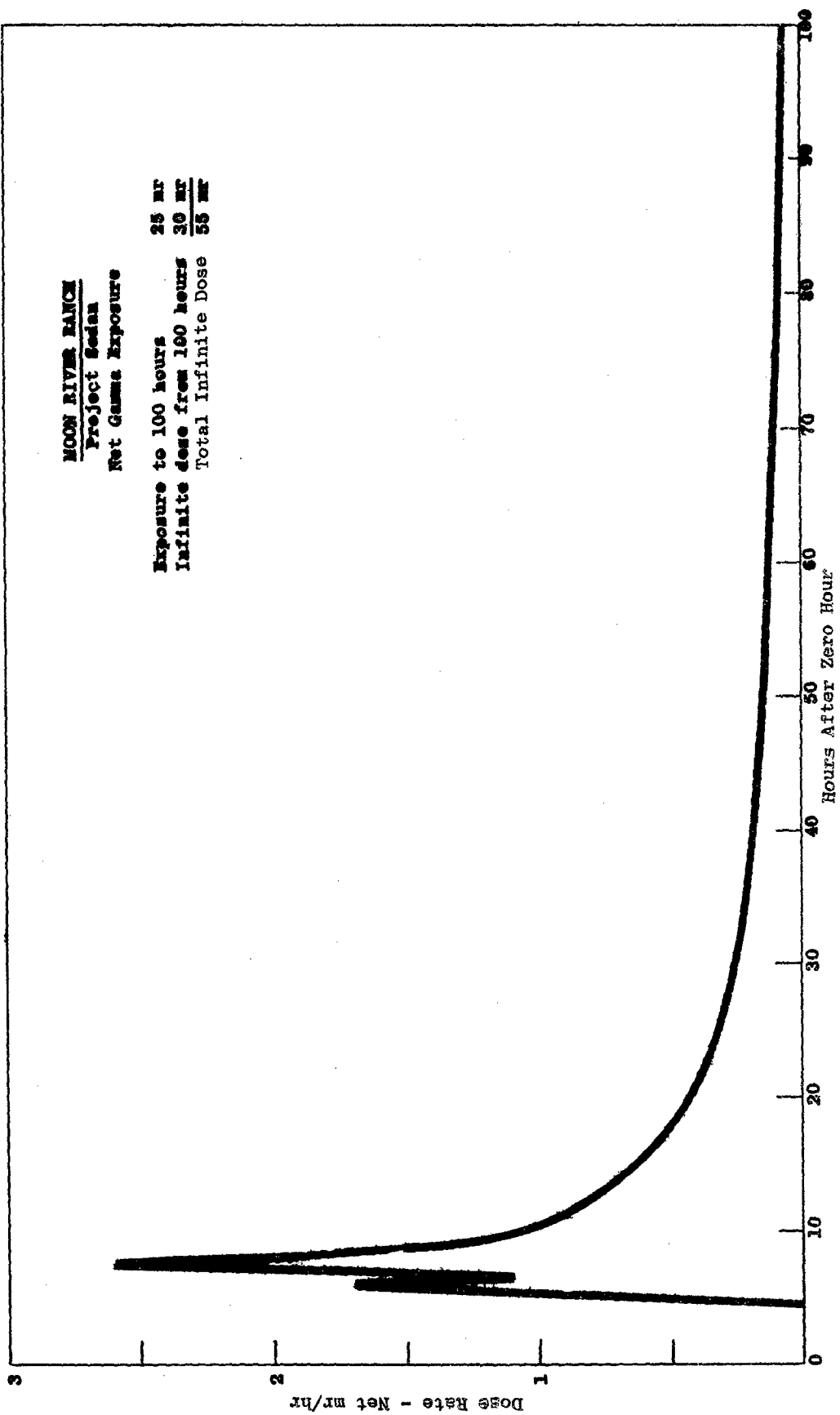
Project Sedan

Net Gamma Exposure

Exposure to 100 hours 25 mr

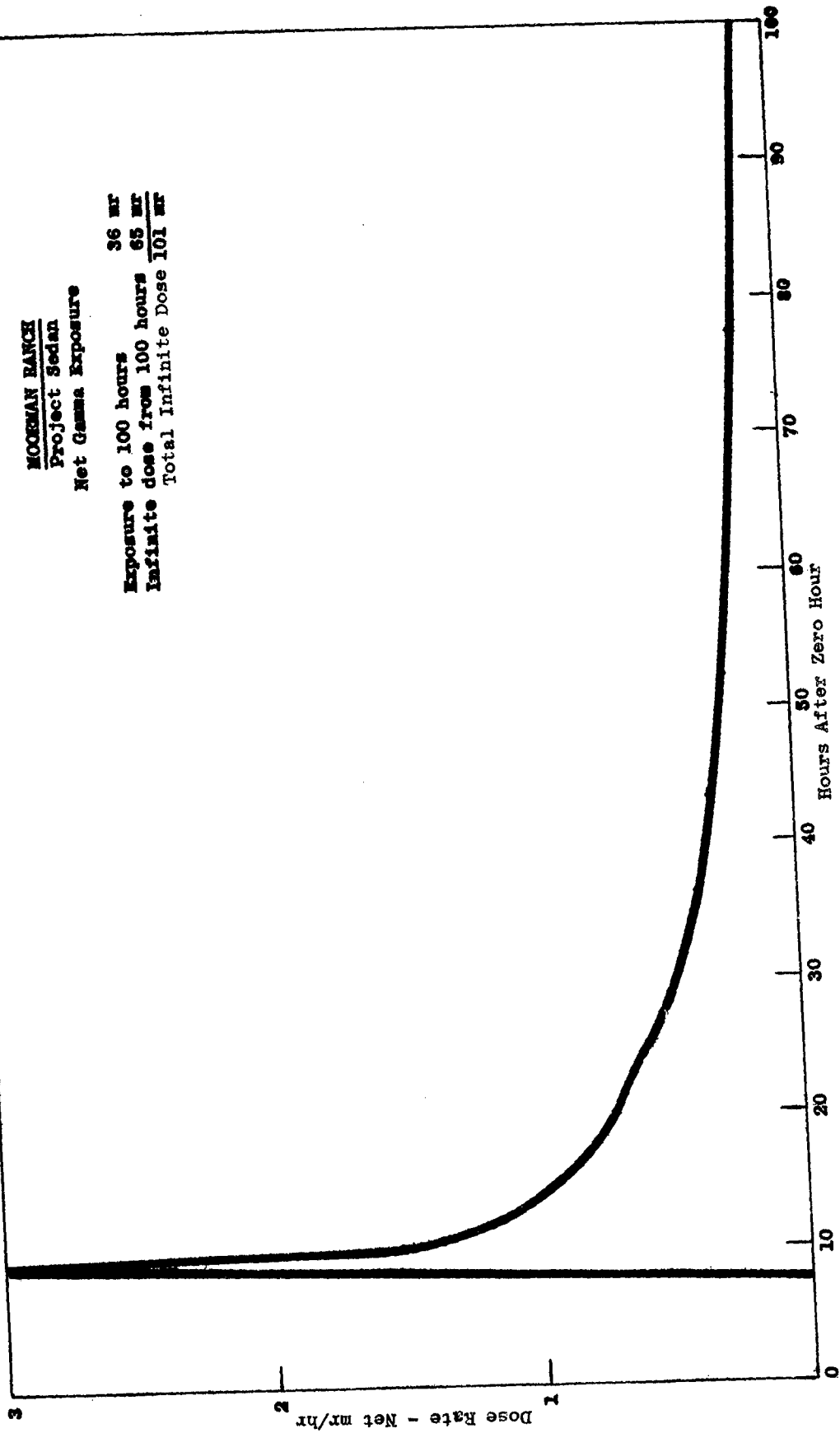
Infinite dose from 100 hours 30 mr

Total Infinite Dose 55 mr



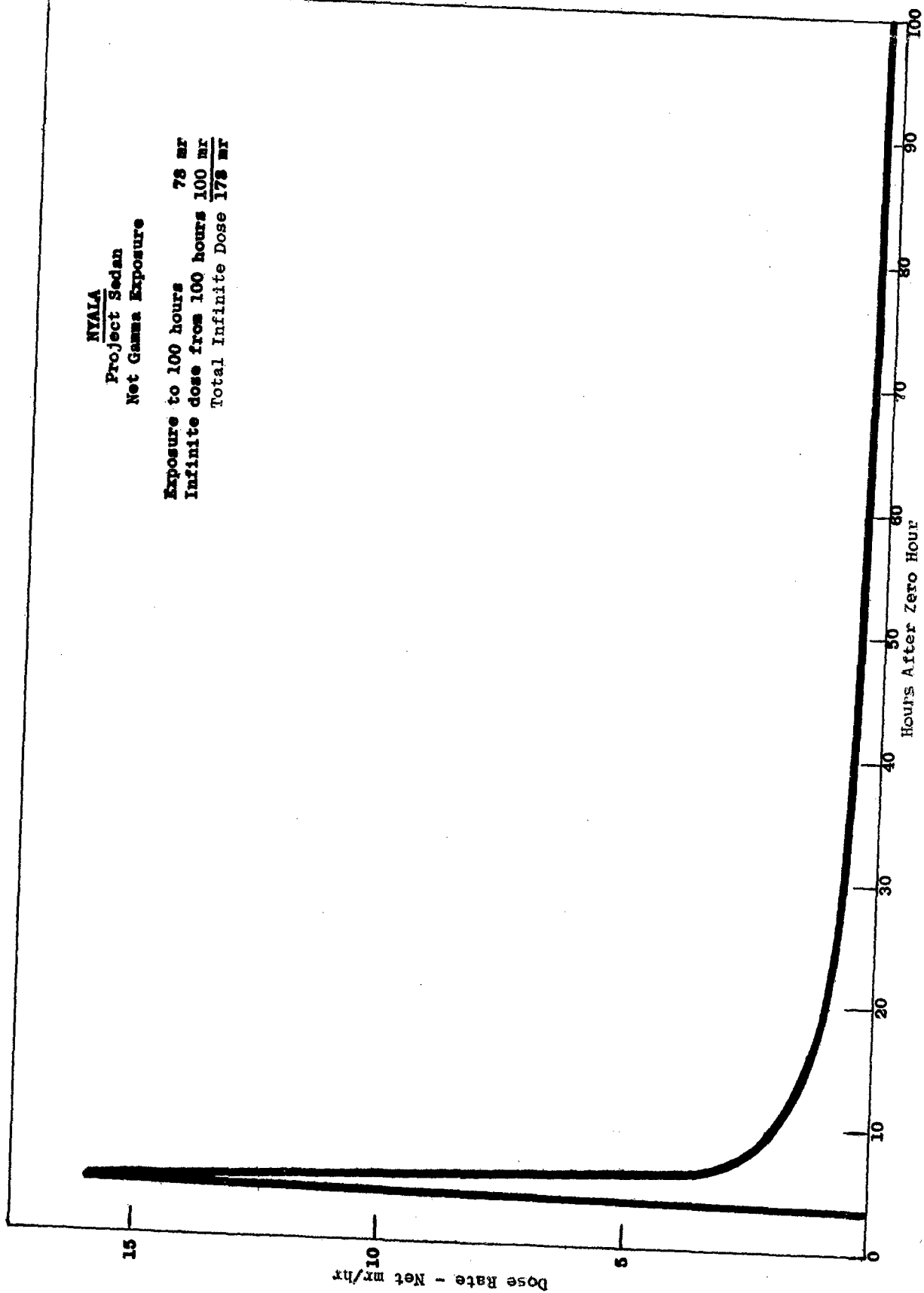
MOOREMAN RANCH
Project Sedan
 Net Gamma Exposure

Exposure to 100 hours 36 mr
 Infinite dose from 100 hours 65 mr
 Total Infinite Dose 101 mr



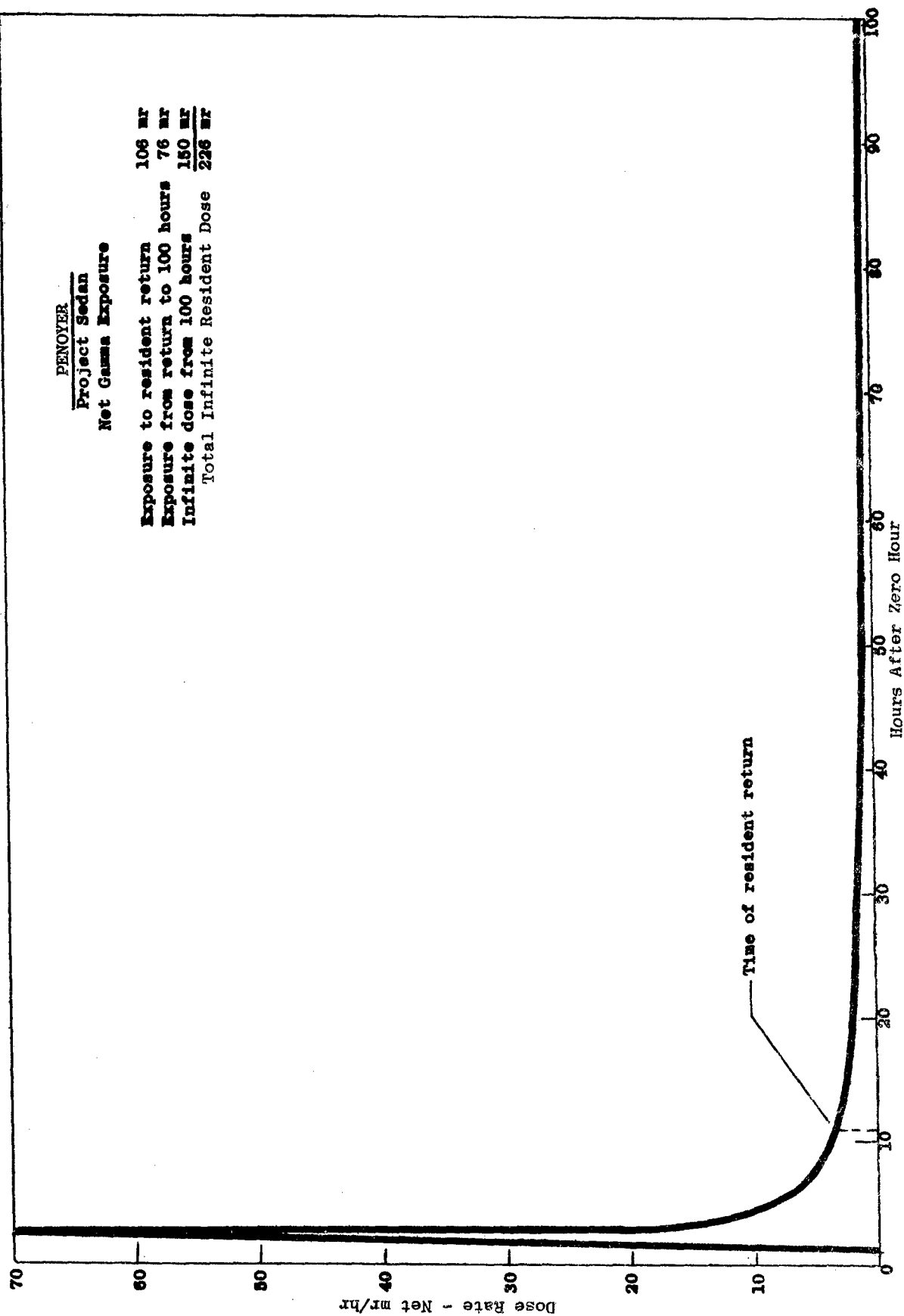
NYALA
Project Sedan
Net Gamma Exposure

Exposure to 100 hours 78 mr
Infinite dose from 100 hours 100 mr
Total Infinite Dose 178 mr



PENOYER
Project Sedan
 Net Gamma Exposure

Exposure to resident return	106 mr
Exposure from return to 100 hours	76 mr
Infinite dose from 100 hours	150 mr
Total Infinite Resident Dose	326 mr



PINE CREEK RANCH

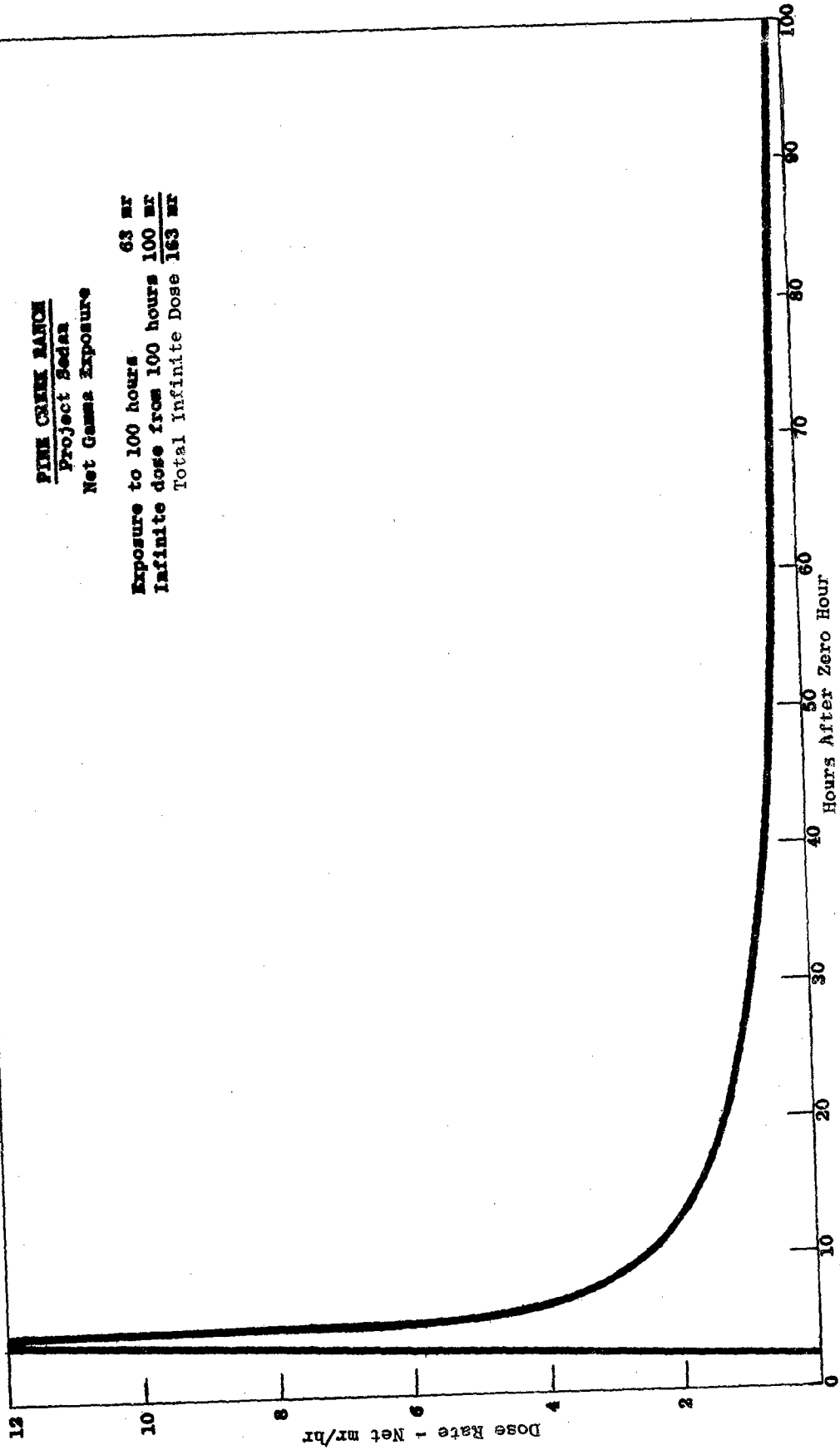
Project Sedan

Net Gamma Exposure

Exposure to 100 hours 63 mr

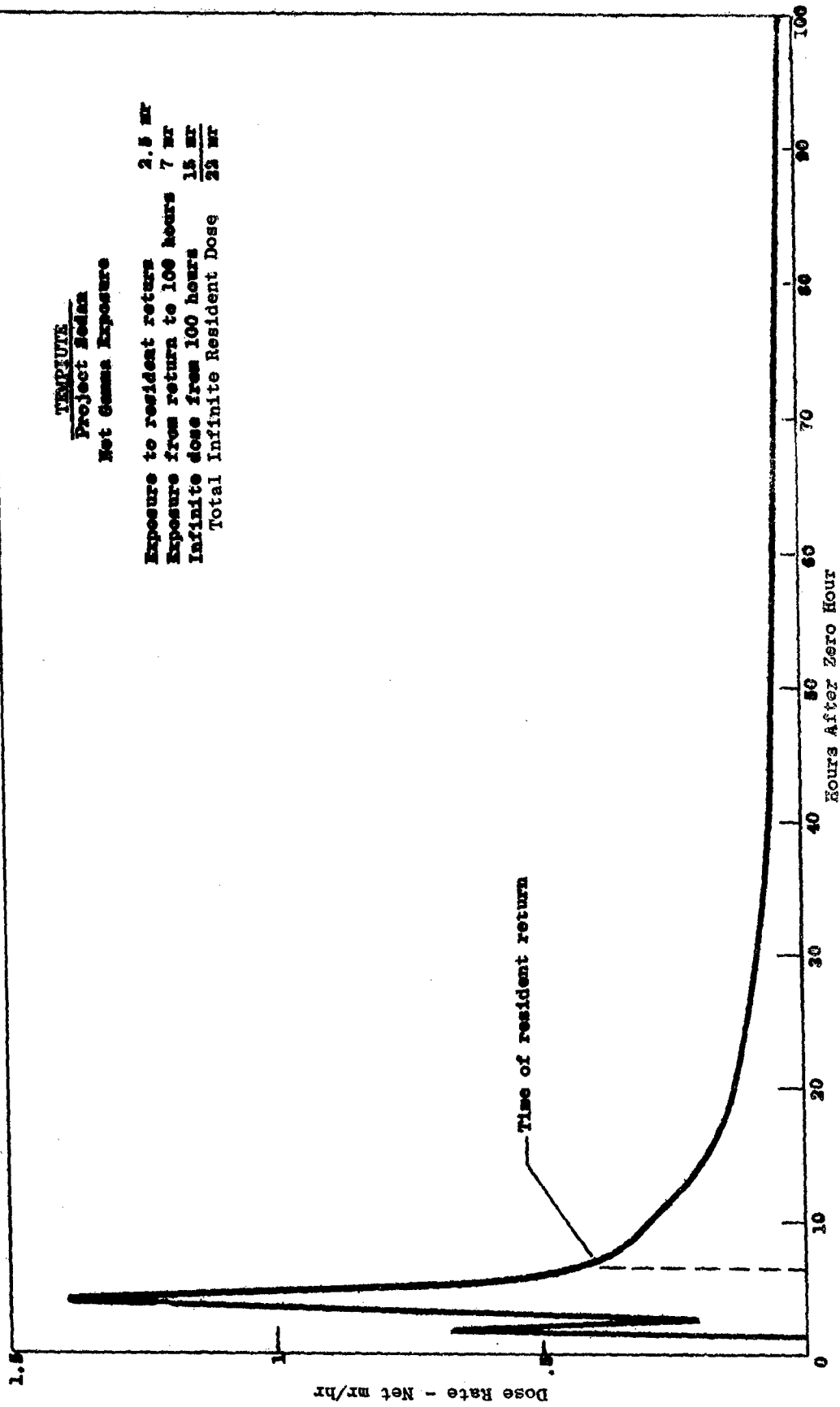
Infinite dose from 100 hours 100 mr

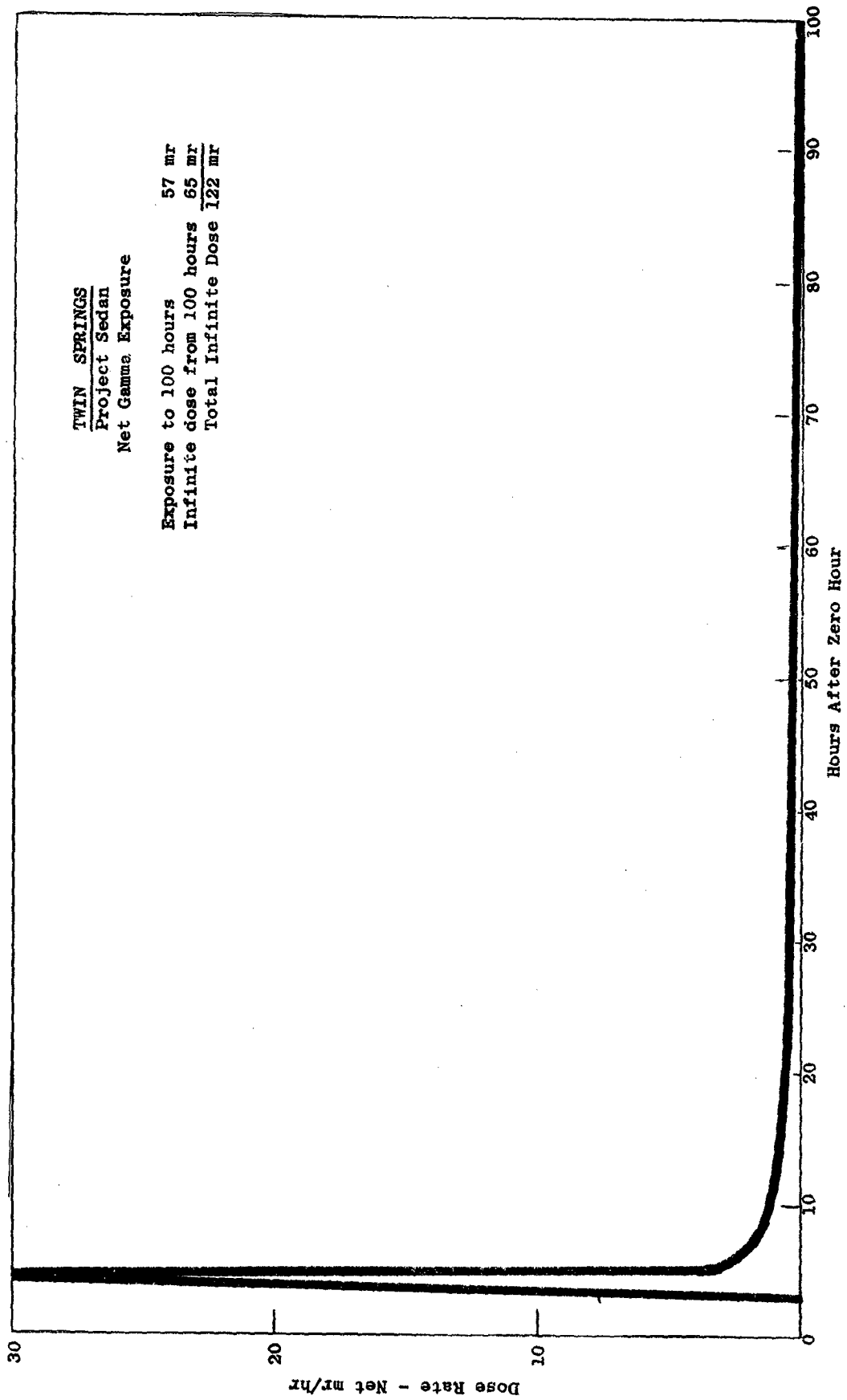
Total Infinite Dose 163 mr



TEMPERATURE
Project Sedan
Net Gamma Exposure

Exposure to resident returns 2.5 mr
Exposure from return to 100 hours 7 mr
Infinite dose from 100 hours 15 mr
Total Infinite Resident Dose 23 mr





Chapter VII

Film Badges

In conjunction with the continuing public relations program being carried out by the U. S. Public Health Service in the Off-Site area, and in efforts to determine personal and community exposures by dosimetry measures, DuPont type 556 dosimeter film packets were worn by general population individuals during the Project Sedan event.

In the following tables, a summary is presented of all film badges worn during the Project Sedan period which indicated exposures that might be due to the passage of the SEDAN cloud. All other film badges worn by individuals at locations not in the cloud path indicated zero exposure or heat damage during the Project Sedan period.

Table IV lists the processing results of personal film badges. It is questionable if the exposures at Hiko are due to Project Sedan. All other exposures listed should be a result of SEDAN to varying degrees. The highest exposure of 275 mr was on the film badge of a resident at Gardner Ranch. However, two other residents at the ranch received 35 mr and 90 mr according to their film badges. Some of the 275 mr exposure may be heat damage. The next highest film badge exposure was 200 mr, worn by a resident of Nyala.

Table V lists the results of "control" badges. These badges are placed on buildings or trees to provide a comparison for personal badges worn in the area.

Table VI lists the exposures received on station badges. The exposure is an average of five badges suspended three feet above the ground at the locations indicated.

TABLE IV
PERSONAL FILM BADGES
PROJECT SEDAN

LOCATION	INDIVIDUAL WEARING BADGE	DATES WORN	mr EXPOSURE
Adaven	Female Adult	6/20 - 7/10	40
Adaven	Male Adult	6/20 - 7/10	70
Adaven	Male Adult	6/20 - 7/10	85
Blue Eagle Ranch	Female Adult	7/4 - 7/10	75
Blue Eagle Ranch	Male Adult	7/4 - 7/10	85
Blue Eagle Ranch	Male Adult	7/4 - 7/10	125
Blue Eagle Ranch	Male Adult	7/4 - 7/10	115
Blue Eagle Ranch	Female Child	7/4 - 7/10	85
Blue Eagle Ranch	Female Child	7/4 - 7/10	105
Blue Eagle Ranch	Female Child	7/4 - 7/10	80
Blue Eagle Ranch	Male Child	7/4 - 7/10	150
Casey Ranch	Female Adult	6/20 - 7/10	70
Casey Ranch	Male Adult	6/20 - 7/10	70
Casey Ranch	Male Adult	6/20 - 7/10	105
Currant Maintenance Sta.	Male Adult	7/3 - 7/10	70
Currant Maintenance Sta.	Male Adult	7/3 - 7/10	65
Diablo	Male Adult	6/19 - 7/9	170
Diablo	Male Adult	6/19 - 7/9	150
Duckwater	Male Adult	7/2 - 7/10	0
Duckwater	Male Adult	7/4 - 7/10	80
Duckwater	Male Adult	7/4 - 7/10	80
Duckwater	Male Adult	7/3 - 7/10	115
Ely	Male Adult	7/2 - 7/12	90
Ely	Male Adult	7/2 - 7/12	85
Ely	Male Adult	7/2 - 7/10	50
Ely	Male Adult	6/26 - 7/24	80
Ely	Male Adult	6/25 - 7/11	80
Ely	Male Adult	7/3 - 7/10	45
Ely	Male Adult	7/2 - 7/12	80
Ely	Male Adult	6/25 - 7/11	90
Ely	Male Adult	7/2 - 7/10	55
Ely	Male Adult	7/2 - 7/11	65
Ely	Male Adult	7/2 - 7/12	75
Ely	Male Adult	7/2 - 7/10	65
Ely	Male Adult	6/26 - 7/24	90
Ely	Male Adult	7/2 - 7/10	55

Table IV
Personal Film Badges
Project Sedan

LOCATION	INDIVIDUAL WEARING BADGE	DATES WORN	mr EXPOSURE
Gardner Ranch	Male Adult	7/2 - 7/11	275
Gardner Ranch	Male Adult	7/3 - 7/11	90
Gardner Ranch	Male Adult	7/3 - 7/11	85
Hiko	Female Adult	7/1 - 7/23	55
Hiko	Male Adult	7/1 - 7/23	55
Lockes	Male Adult	7/4 - 7/10	110
Lund	Male Adult	7/2 - 7/11	70
Lund	Male Adult	7/2 - 7/11	65
Lund	Male Adult	6/19 - 7/11	60
Lund	Male Adult	6/19 - 7/11	70
Manzonie Ranch (4 miles NE of Currant)	Male Adult	7/4 - 7/10	75
Manzonie Ranch	Male Adult	7/3 - 7/10	110
Manzonie Ranch	Male Adult	7/3 - 7/10	70
Manzonie Ranch	Male Adult	7/3 - 7/10	100
Manzonie Ranch	Male Adult	7/3 - 7/10	80
Manzonie Ranch	Male Adult	7/3 - 7/10	75
Nyala	Female Adult	6/20 - 7/10	55
Nyala	Female Adult	6/20 - 7/10	70
Nyala	Female Adult	6/20 - 7/10	75
Nyala	Male Adult	6/19 - 7/10	85
Nyala	Male Adult	6/19 - 7/10	105
Nyala	Male Adult	6/20 - 7/10	200
Nyala	Male Adult	6/19 - 7/10	160
Nyala	Male Adult	6/20 - 7/10	85
Nyala	Male Child	6/20 - 7/10	170
Penoyer	Male Adult	6/6 - 7/19	0
Penoyer	Male Adult	6/8 - 7/19	170
Pine Creek Ranch	Female Adult	6/20 - 7/10	220
Pine Creek Ranch	Male Adult	6/20 - 7/10	125
Rattlesnake	Male Adult	6/19 - 7/20	60
Rattlesnake	Male Adult	6/19 - 7/20	65
Sunnyside	Male Adult	7/2 - 7/11	50
Troy Mine (4 miles SW of Blue Eagle Ranch)	Female Adult	6/19 - 7/10	30
Troy Mine	Male Adult	6/19 - 7/10	55
Troy Mine	Male Adult	6/19 - 7/10	65
Twin Springs	Female Adult	6/19 - 7/10	35
Twin Springs	Female Adult	6/19 - 7/10	130
Twin Springs	Male Adult	6/19 - 7/9	110
Warm Springs	Male Adult	6/19 - 7/19	50
Warm Springs	Male Adult	6/19 - 7/19	50

TABLE V
CONTROL FILM BADGES
PROJECT SEDAN

LOCATION	OBJECT	DATES EXPOSED	mr EXPOSURE
Blue Eagle Ranch	Tree	7/4 - 7/10	115
Blue Eagle Ranch	Fence	7/4 - 7/10	160
Currant	Tree	7/3 - 7/11	100
Currant	Tree	7/4 - 7/10	90
Currant Maintenance Station	Fence	7/3 - 7/11	150
Duckwater	Pole	7/3 - 7/10	130
Gardner Ranch	Tree	7/3 - 7/11	90
Hiko	Roof	3/21 - 9/3	0
Hiko	Shed	7/1 - 7/23	55
Lockes	Tree	7/4 - 7/10	260
Lund	Roof	7/2 - 7/11	70
Manzonie Ranch (4 miles NE of Currant)	Tree	7/3 - 7/10	90
Shell Oil Site (10 miles S of Currant)	Tree	7/4 - 7/10	165
Sunnyside	Post	7/2 - 7/11	55
Sunnyside	Fence	7/2 - 7/11	65

TABLE VI
STATION FILM BADGES
PROJECT SEDAN

LOCATION	DATES EXPOSED	mr EXPOSURE
Diablo	6/29 - 7/9	1322
Hot Creek Ranch	6/19 - 7/20	50
Penoyer	6/29 - 7/10	83
Pine Creek Ranch	6/20 - 7/10	215
Rattlesnake	6/19 - 7/20	140
8 miles East of Reed *	6/29 - 7/9	2625
Simpson Ranch	6/20 - 7/10	115
Uhalde Ranch	6/20 - 7/10	140
Warm Springs	6/29 - 7/9	59

* Reed is not a populated location and should not be used in attempts to determine exposures to the off-site population.

Chapter VIII

Fallout Trays

Standard 8" x 10" metal fallout trays placed three feet above the ground were used for the Project Sedan event. The trays were collected on D+1 or earlier and counted for gross beta and specific gamma isotopic activity. The gamma activities were then extrapolated to time of peak cloud passage using $A_t = A_0 e^{-\lambda t}$, and the gross beta activity extrapolated graphically to peak cloud passage time. The gross beta decay curves exhibited essentially the same characteristics as those drawn for air filter decays. See Chapter X. The extrapolated values are shown in the following table and figure.

As shown in Figure V, fallout tray numbers one through fifty-five were placed in a rough arc of thirty-five to forty miles radius from Ground Zero. Reference to Figure I in Chapter II will give a relative position of the arc in the off-site area. Figure V gives a logarithmic plot of the extrapolated gross beta activity on each tray in the arc. The numerical values of the activity are listed in Table VII. Unfortunately, a herd of cattle managed to destroy some of the trays between Reed and Queen City Summit, thereby causing a break in data continuity. The graph tends to indicate cloud edges at Coyote Summit and two miles east of Cedar Pass, with some possible nighttime smearing of activity between stake numbers forty-five and fifty-five. Ten microcuries per square meter might be assumed as an average background value for gross beta activity collected on a fallout tray at the times and locations listed in Table VII.

The results of gamma spectroscopy analysis of the fallout trays are also presented in Table VII. The first section deals with the fallout trays placed in the above mentioned arc, and the last page lists results from trays placed at specific locations in the cloud path.

One irregularity is evident at the Eureka station. Gross beta activity was $120 \mu\text{c}/\text{M}^2$, the same as in Ely, while the isotopic analysis indicates no activity. Ground monitoring in the area placed the west edge of the cloud a few miles east of Eureka. Thus, the $120 \mu\text{c}/\text{M}^2$ gross beta activity figure for that station may be erroneous.

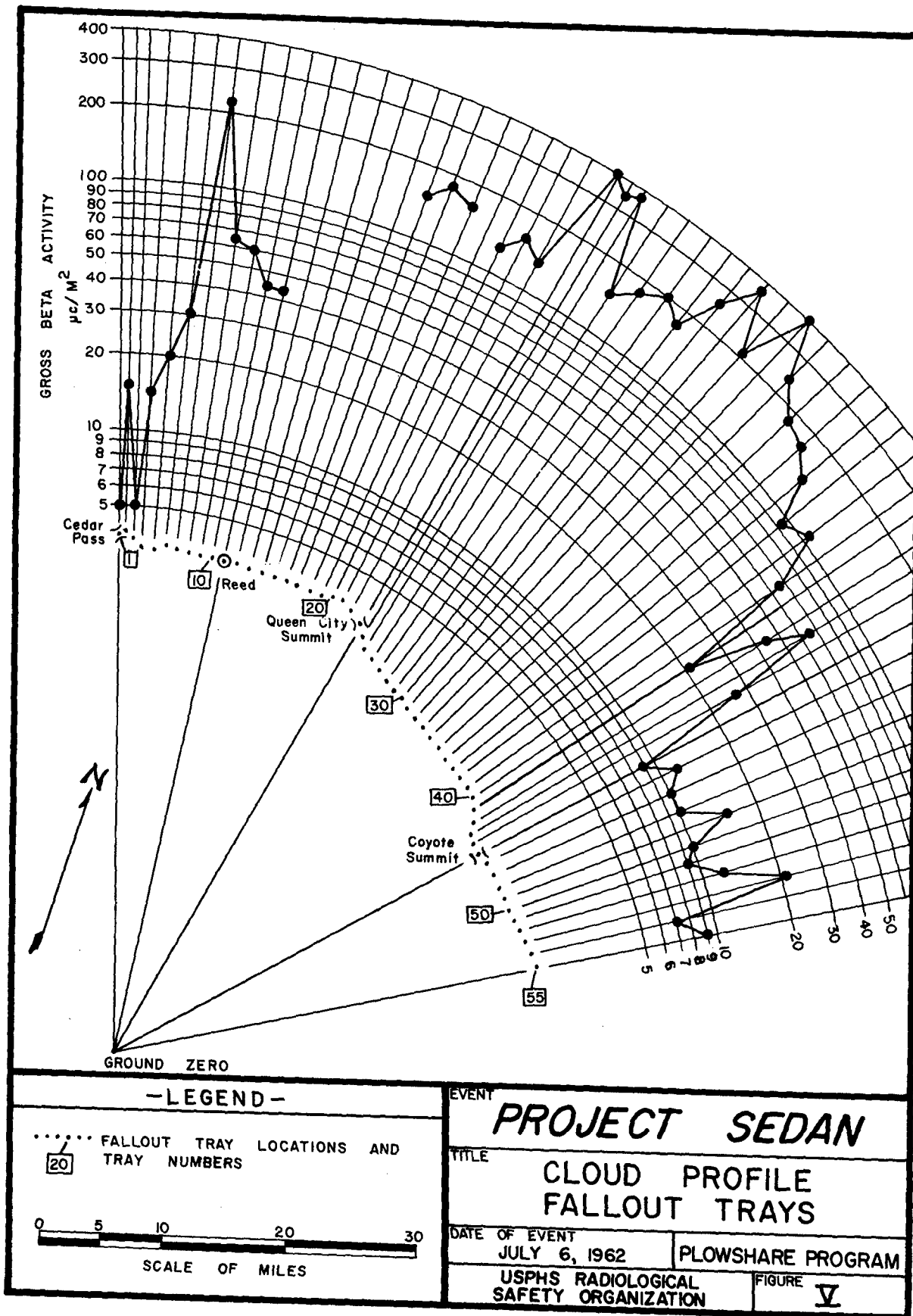


TABLE VII
FALLOUT TRAY RESULTS
PROJECT SEDAN

TRAY NUMBER AND/OR LOCATION	AZIMUTH, DEGREES	DISTANCE, MILES	TIME-DATE COLLECTION	$\mu\text{C}/\text{M}^2$ At 1130 Hours, 7-6-62							
				GROSS BETA	I ¹³¹	I ¹³³	I ¹³⁵	Te ¹³²	Ba ¹⁴⁰ La ¹⁴⁰	Ru ¹⁰³	Zr ⁹⁵ Nb ⁹⁵
1 (Cedar Pass)	343	42	1943-7/5 1416-7/7	5	.02	D	ND	.04	ND	.01	ND
2	344	42	1945-7/5 1430-7/7	15	.04	D	ND	.75	.03	.02	ND
3	345	41	1947-7/5 1410-7/7	5	.02	D	ND	.04	ND	.01	ND
4	346	41	1950-7/5 1405-7/7	14	.04	D	ND	.08	ND	ND	ND
5	347	41	1952-7/5 1445-7/7	20	.03	D	ND	ND	ND	ND	ND
6	348	41	1955-7/5 1350-7/7	30	.04	D	ND	.07	< .01	.01	ND
7	349	41	1957-7/5 1630-7/7	220	.03	D	ND	.07	.02	< .01	ND
8	351	41	2000-7/5 1625-7/7	64	.03	D	ND	.07	< .01	.02	ND
9	352	41	2003-7/5 1640-7/7	60	.04	D	ND	< .01	ND	.04	ND
10	353	41	2020-7/5 1645-7/7	44	.09	D	ND	.12	.05	.02	ND
11 (Reed)	354	41	2025-7/5 1650-7/7	43	.06	D	ND	.11	.04	.02	ND
12	356	41	Knocked down by cattle.								
13	357	41	Knocked down by cattle.								
14	358	41	Knocked down by cattle.								

ND - Not detected.

D - Detected but not quantitated.

Table VII
Fallout Tray Results
Project Sedan

TRAY NUMBER AND/OR LOCATION	AZIMUTH, DEGREES	DISTANCE MILES	TIME-DATE COLLECTION	$\mu\text{c}/\text{M}^2$ At 1130 Hours, 7-6-62							
				GROSS BETA	I ¹³¹	I ¹³³	I ¹³⁵	Te ¹³²	Ba ¹⁴⁰ La ¹⁴⁰	Ru ¹⁰³	Zr ⁹⁵ Nb ⁹⁵
15	360	41	Knocked down by cattle.								
16	1	41	1855-7/5 1700-7/7	150	20	D	ND	22	7.8	4.4	ND
17	3	41	1852-7/5 1710-7/7	180	11	D	ND	15	7.6	6.0	ND
18	4	41	1850-7/5 1715-7/7	160	8.5	D	ND	13	6.8	2.3	ND
19	6	41	Knocked down by cattle.								
20	7	41	1840-7/5 1720-7/7	130	10	D	ND	17	8.0	3.0	ND
21	8	42	1830-7/5 1143-7/7	150	13	D	ND	17	7.6	4.4	ND
22	9	42	1825-7/5 1138-7/7	130	28	D	ND	43	21	4.8	ND
23 (Queen City Summit)	1	40	2015-7/5 1131-7/7	400	3.4	D	ND	4.7	2.4	.66	ND
24	12	39	2000-7/5 1130-7/7	340	4.7	D	ND	5.6	2.2	1.1	ND
25	13	39	1955-7/5 1125-7/7	370	2.8	D	ND	5.0	1.2	1.0	ND
26	14	39	1950-7/5 1118-7/7	150	9.1	D	ND	14	4.9	2.2	ND
27	16	38	1945-7/5 1111-7/7	180	8.2	D	ND	12	.55	1.8	ND
28	17	38	1940-7/5 1106-7/7	200	6.6	D	ND	9.7	3.5	3.1	ND
29	19	38	1935-7/5 1051-7/7	170	6.9	D	ND	13	5.5	2.1	ND

ND - Not detected.

D - Detected but not quantitated.

Table VII
Fallout Tray Results
Project Sedan

TRAY NUMBER AND/OR LOCATION	AZIMUTH, DEGREES	DISTANCE, MILES	TIME-DATE COLLECTION	$\mu\text{c}/\text{M}^2$ At 1130 Hours, 7-6-62							
				GROSS BETA	I ¹³¹	I ¹³³	I ¹³⁵	Te ¹³²	Ba ¹⁴⁰ La ¹⁴⁰	Ru ¹⁰³	Zr ⁹⁵ Nb ⁹⁵
30	20	37	1930-7/5 1045-7/7	250	4.7	D	ND	8.0	3.7	2.7	ND
31	21	37	1925-7/5 1038-7/7	370	2.7	D	ND	4.3	2.0	.45	ND
32	23	37	1920-7/5 1027-7/7	210	4.7	D	ND	7.1	2.8	1.1	ND
33	25	37	1915-7/5 1020-7/7	390	1.3	D	ND	1.8	1.0	1.4	ND
34	26	37	1910-7/5 1015-7/7	240	.58	D	ND	.97	.44	.12	ND
35	28	37	1905-7/5 1010-7/7	180	.30	D	ND	4.7	.21	.09	ND
36	29	36	1900-7/5 1005-7/7	170	.61	D	ND	.28	.11	ND	ND
37	31	36	1855-7/5 0950-7/7	140	.16	D	ND	.31	.08	< .01	ND
38	32	36	1850-7/5 0945-7/7	92	.13	D	ND	.15	.07	.05	ND
39	34	36	1845-7/5 0930-7/7	110	.15	D	ND	.19	.09	.05	ND
40	35	36	1840-7/5 0920-7/7	68							
41	37	36	1835-7/5 0915-7/7	21	.05	D	ND	.07	.05	.07	ND
42	38	35	1830-7/5 0945-7/7	44	.07	D	ND	.11	.06	.02	ND
43	39	34	1820-7/5 0900-7/7	66	.10	D	ND	.18	.09	.03	ND

ND - Not detected.

D - Detected but not quantitated.

Table VII
Fallout Tray Results
Project Sedan

TRAY NUMBER AND/OR LOCATION	AZIMUTH, DEGREES	DISTANCE, MILES	TIME-DATE COLLECTION	$\mu\text{c}/\text{M}^2$ At 1130 Hours, 7-6-62							
				GROSS BETA	I ¹³¹	I ¹³³	I ¹³⁵	Te ¹³²	Ba ¹⁴⁰ La ¹⁴⁰	Ru ¹⁰³	Zr ⁹⁵ Nb ⁹⁵
44	40	34	1815-7/5 0855-7/7	27	.06	D	ND	.09	.04	ND	ND
45 (Coyote 42 Summit)	42	34	1800-7/5 0840-7/7	9	.04	D	ND	.06	.02	.01	ND
46	44	34	1830-7/5 0835-7/7	12	.03	D	ND	.08	.03	.02	ND
47	46	34	1840-7/5 0830-7/7	10	.04	D	ND	.05	ND	< .01	ND
48	48	34	1850-7/5 0820-7/7	10		D	ND				
49	49	34	1900-7/5 0815-7/7	15	.03	D	ND	.06	ND	.02	ND
50	51	34	1910-7/5 0810-7/7	10	.05	D	ND	.08	ND	.02	ND
51	52	34	1915-7/5 0755-7/7	9	.08	D	ND	.05	ND		
52	54	34	1930-7/5 0745-7/7	12	.05	D	ND	.07	.53	< .01	ND
53	56	35	1940-7/5 0744-7/7	21	.08	D	ND	.09	ND	.04	ND
54	57	35	1950-7/5 0725-7/7	7	.03	D	ND	.06	ND	ND	ND
55	60	35	2000-7/5 0730-7/7	9	.03	D	ND	.06	ND	.01	ND

ND - Not detected.

D - Detected but not quantitated.

Table VII
Fallout Tray Results
Project Sedan

INDIVIDUAL STATION FALLOUT TRAYS

STATION LOCATION - AZIMUTH, DEGREES - DISTANCE, MILES	TIME-DATE COLLECTION	PEAK CLOUD PASSAGE TIME	$\mu\text{c}/\text{M}^2$ AT PEAK CLOUD PASSAGE TIME							
			GROSS BETA	I ¹³¹	I ¹³³	I ¹³⁵	Te ¹³²	Ba ¹⁴⁰ La ¹⁴⁰	Ru ¹⁰³	Zr ⁹⁵ Nb ⁹⁵
Currant; 15 degrees; 113 miles	1045-7/6 1110-7/7	1738-7/6	350	.45	D	ND	.65	.26	.10	ND
Currant Maintenance Station; 17 degrees; 119 miles	1020-7/6 1045-7/7	1738-7/6	120	1.6	D	ND	.91	.44	.24	ND
Duckwater; 9 degrees; 120 miles	1106-7/6 1130-7/7	1800-7/6	62	.81	D	ND	1.2	.35	.26	ND
El Dorado; 4 degrees; 153 miles	2100-7/5 0930-7/7	2100-7/6	11	< .01	D	ND	.19	ND	.10	ND
Ely; 23 degrees; 156 miles	0900-7/6 0800-7/7	2000-7/6	120	.36	D	ND	.15	.26	.14	ND
Eureka; 2 degrees; 163 miles	2130-7/5 0730-7/7	2100-7/6	120	ND	D	ND	ND	ND	ND	ND
Moorman Ranch; 13 degrees; 156 miles	2000-7/5 1014-7/7	1915-7/6	150	.23	D	ND	.35	.17	.04	ND
Penoyer; 22 degrees; 37 miles	1100-7/6 0925-7/7	1130-7/6	27	2.1	D	ND	3.1	1.4	.69	ND
Adaven; 20 degrees; 71 miles	- 7/6 - 7/6	1430-7/6	160	.73	D	ND	.93	.48	.16	ND
Twin Springs; 355 degrees; 72 miles	0815-7/6 - 7/7	1420-7/6	180	.30	D	ND	.38	.15	.08	ND
Twin Springs Turnoff; 355 degrees; 71 miles	1230-7/6 1605-7/7	1420-7/6	300	.44	D	ND	< .01	.35	.11	ND
Pine Creek Ranch; 20 degrees; 62 miles	- 7/6 - 7/6	1430-7/6	400	.12	D	ND	.18	.10	.13	ND

ND - Not detected.

D - Detected but not quantitated.

Chapter IX

Sample Analysis

Glass fiber air filters and fallout trays were counted for gross beta activity in the proportional range on Nuclear-Chicago Model 192-A ultrascalers with Eberline Model AC-4 large area probes having efficiencies of 30 - 40% for Sr^{90} - Y^{90} . Filters with activity significantly above radon-thoron daughter product and long-lived fission product background levels were counted several times within three to five days to study decay characteristics. Water samples were counted for gross beta activity on a Tracerlab internal proportional counter.

Glass fiber air filters with gross beta activity significantly above background levels, and all charcoal cartridges, fallout trays, water samples, and vegetation samples were counted for specific gamma emitting isotopes on a RIDL 400-channel spectrometer, using a steel shield with a 4" x 4" NaI (Tl) crystal with a Cs^{137} peak resolution of eight per cent.

Chapter X

Air Sampling

Thirty air sampling stations were in operation in populated locations in the off-site area during Project Sedan. The air samplers used were Staplex high volume samplers using 8" x 10" glass fiber filters.

In addition to the glass fiber filter, fourteen of the samplers were equipped with an MSA activated charcoal cartridge filter for the collection of gaseous fission products. Flow rates are approximately 50 cfm for the glass fiber filter alone, and 25 cfm with the additional charcoal cartridge in place. See Figure VI for the air sampling station locations.

Glass fiber filters were counted for gross beta activity, and if the activity warranted further analysis, the filters were gamma scanned for specific gamma emitting isotopes, as were all charcoal cartridges. For methods of analysis, see Chapter IX.

The following table presents the results of air sample gross beta and isotopic analysis. Air sampling results are reported here for the period July 6-11, 1962. On July 11, 1962, the Johnny Boy event occurred, and it was not deemed desirable to carry the data in this report beyond that date. Further data can be obtained from the Johnny Boy interim report.

The isotopic activities in Table VIII have been extrapolated from count time activities using $A_t = A_0 e^{-\lambda t}$. In many cases, it was impossible to count the samples immediately. Therefore, any short-lived activity such as I^{133} and I^{135} , and in certain cases Te^{132} , would not have been detected at count time, even if present originally.

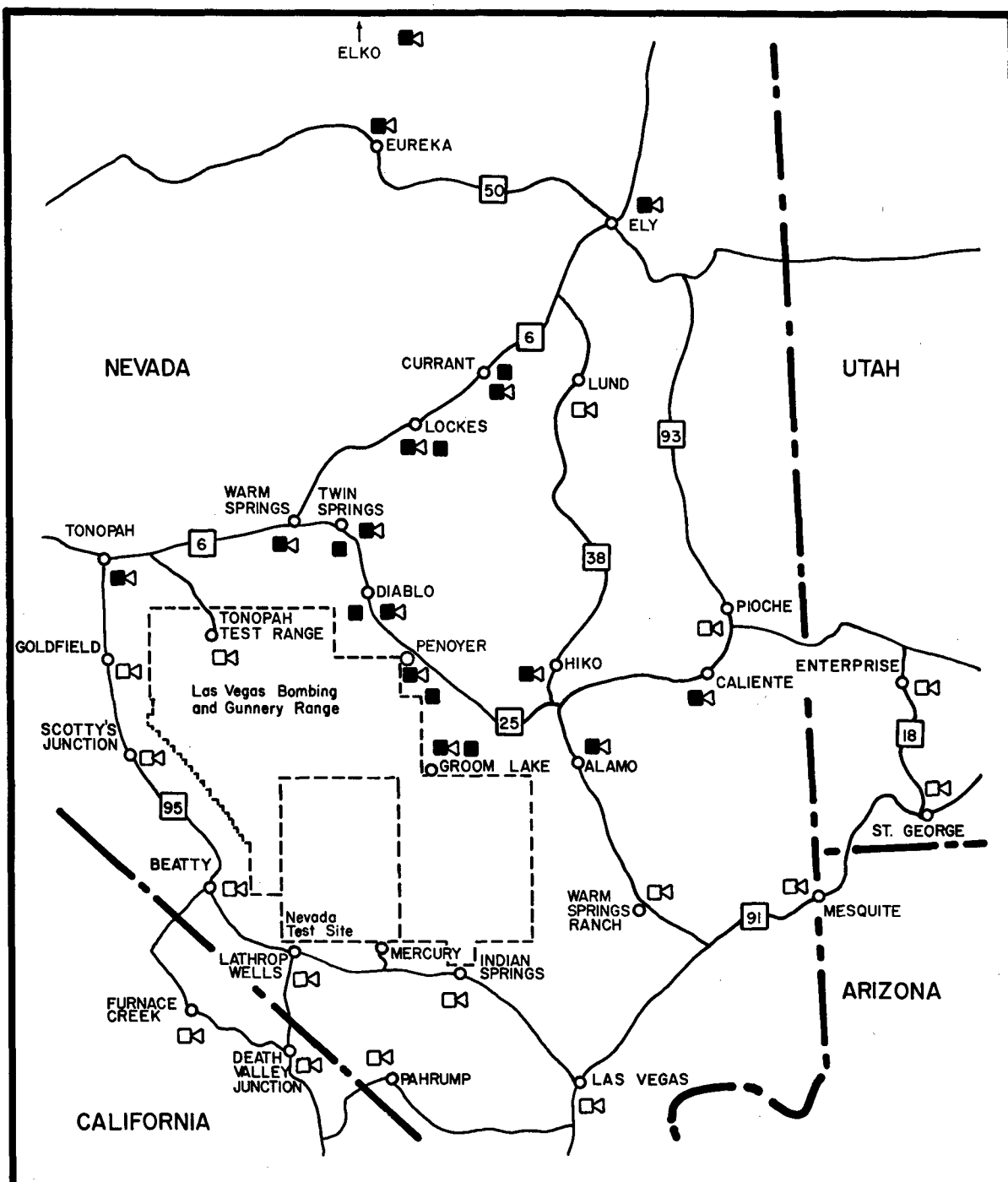
Gross beta activity extrapolation was performed graphically. Decay studies have been plotted on log-log and semi-log paper to extrapolate to time of collection. In general, the two methods gave approximately the same answers, so the average has been reported.

In instances of late counting, it was necessary to extrapolate using curves derived from those samples that were similar in collection times and geographic location and on which decay data could be obtained.




Generally, the samples did not exhibit a straight line decay on log-log paper. On semi-log paper they exhibit the decay characteristics of one or two isotopes, rather than the usually assumed mixed fission products associated with this type of test.

Several stations (Carrant, Diablo, Ely, Groom Lake, and Lund) indicate an activity rise above the normal decay scheme on July 9-10. This is assumed to be due to stiff winds picking up dust from the Sedan crater area and carrying it off the test site.

Gross beta air filter results at all other locations than those listed in the table were essentially background on July 6-11, 1962. Goldfield had the highest background peak of $14 \mu\mu\text{c}/\text{M}^3$ on July 9, 1962, and Las Vegas the lowest with $0.8 \mu\mu\text{c}/\text{M}^3$ on July 9, 1962.



—LEGEND—

-  AIR SAMPLER
-  AIR SAMPLER WITH CHARCOAL CARTRIDGE
-  RADIATION MONITORING RECORDER

0 10 20 30 40 50
SCALE OF MILES

EVENT

PROJECT SEDAN

TITLE

**OFF-SITE AREA
INSTRUMENT LOCATIONS**

DATE OF EVENT

JULY 6, 1962

PLOWSHARE PROGRAM

USPHS RADIOLOGICAL
SAFETY ORGANIZATION

FIGURE

VI

TABLE VIII
AIR SAMPLING GROSS BETA AND ISOTOPIC ACTIVITY RESULTS

PROJECT SEDAN

LOCATION	TIME-DATE COLLECTION	VOLUME OF AIR SAMPLED, M ³	TIME ACTIVITY EXTRAPOLATED TO	GLASS FIBER FILTER & CHARCOAL CARTRIDGE (IN PARENTHESES) ACTIVITY (μuc/M ³)						
				GROSS BETA	I ¹³¹	I ¹³³	I ¹³⁵	Te ¹³²	Ba ¹⁴⁰ La ¹⁴⁰	Zr-Nb ⁹⁵
Alamo	0730 7/6	1228	MP 7/6	7.8 ^j	ND (.27)	ND (4.4)	ND (ND)	.98 (.47)	103 .65	3.8
Alamo	0730 7/7	1249		2.9 ^j						
Alamo	0800 7/8	1466		1.1 ^j						
Alamo	0700 7/9	1562		3.9 ^j						
Alamo	0730 7/10	2650		4.2 ^j						
Caliente	1010 7/4	2650								1.8
Caliente	0720 7/5	2650	MP 0920 7/6		ND (ND)	ND (.86)	ND (ND)	ND (ND)	ND (ND)	.45
Caliente	1115 7/7	1386		3.6 ^j						
Caliente	1600 7/8	777		7.4 ^j						
Caliente	0820 7/9	1034		3.9 ^j						
Caliente	0828 7/9									
Caliente	0930 7/10									

Notes: Gross beta air filter results at all other locations were essentially background on July 6-11, 1962.

MP = Mid-point of collection time.

ND = Not detected.

j = Decay studies were not run on these filters and extrapolated activity results, therefore, are not available.

Activity shown is that at time of count.

Table VIII
Air Sampling Gross Beta and Isotopic Activity Results
Project Sedan

LOCATION	TIME-DATE COLLECTION	VOLUME OF AIR SAMPLED M ³	TIME ACTIVITY EXTRAPOLATED TO	GLASS FIBER FILTER & CHARCOAL CARTRIDGE (IN PARENTHESIS) ACTIVITY (µuc/M ³)							
				GROSS BETA	I 131	I 133	I 135	Te 132	Ba 140 La 140	Ru 103	Zr-Nb 95
Currant	0710 7/6 0709 7/7	879	CP 1738 7/6	5000	420	ND	ND	1100	380	170	690
Currant	0700 7/7 0730 7/8	897	MP 1915 7/7	600	20 (19)	ND (860)	ND (ND)	26 (ND)	10 (ND)	8.6	D
Currant	0730 7/8 0705 7/9	863	MP 1917 7/8	470	18	ND	ND	23	9.6	8.1	D
Currant	0705 7/9 0705 7/10	835	MP 1905 7/9	140	56	ND	ND	69	37	24	D
Currant	0705 7/10 0705 7/11	835	MP 1905 7/10	130	8.2	ND	ND	8.5	4.3	4.2	D
Diablo	0905 7/6 1637 7/6	358	CP 1302 7/6	13,000	3400 (260)	ND (13,000)	ND (60,000)	ND (380)	3000 (140)	940	ND (490,000)
Diablo	1645 7/6 2000 7/6	163	MP 1822 7/6	3300	35 (28)	ND (780)	ND (ND)	61 (66)	ND (ND)	14	ND
Diablo	0800 7/6 0750 7/7	1180	CP 1302 7/6	1900	13 (7.2)	ND (240)	ND (500)	26 (6.6)	6.7 ND	4.9	ND
Diablo	0750 7/7 0700 7/8	1024	MP 1925 7/7	1900	49 (11)	ND (170)	ND (ND)	83 (2.5)	31 (1.3)	19	D
Diablo	0700 7/8 0700 7/9	1020	MP 1900 7/8	1100	33 (7.1)	ND (34)	ND (ND)	44 (1.4)	20 (ND)	13	D
Diablo	0700 7/9 0710 7/9	345	MP 1205 7/9	500	17 (17)	ND (ND)	ND (ND)	26 (21)	11 (9.1)	D (7.4)	D
Diablo	0710 7/9 0700 7/10	517	MP 0005 7/10	220	26	ND	ND	30	17	11	D
Diablo	0700 7/10 0700 7/11	938	MP 1900 7/10	150	9.1	ND	ND	8.4	4.5	4.3	D

Notes: Gross beta air filter results at all other locations were essentially background on July 6-11, 1962.

CP = Cloud passage time.

MP = Mid-point of collection time.

ND = Not detected.

D = Detected, but not quantitated.

Table VIII
Air Sampling Gross Beta and Isotopic Activity Results
Project Sedan

LOCATION	TIME-DATE COLLECTION	VOLUME OF AIR SAMPLED M ³	TIME ACTIVITY EXTRAPOLATED TO	GLASS FIBER FILTER & CHARCOAL CARTRIDGE (IN PARENTHESIS) ACTIVITY (µc/M ³)							
				GROSS BETA	I ¹³¹	I ¹³³	I ¹³⁵	Te ¹³²	Ba ¹⁴⁰ La	Ru ¹⁰³	Zr-Nb ⁹⁵
Elko	0930 7/6 1930 7/6	467	MP 1430 7/6	3.6j	ND (ND)	ND (ND)	ND (ND)	ND (ND)	ND (ND)	.95	1.5
Elko	1930 7/6 0630 7/7	556	MP 0100 7/7	4.7j	ND (ND)	ND (ND)	ND (ND)	ND (ND)	ND (ND)	.96	1.6
Ely	0800 7/6 2000 7/6	611	CP 2000 7/6	5000	230 (5.2)	ND (250)	ND (ND)	370 (ND)	190 (ND)	83	ND
Ely	2000 7/6 0900 7/7	561	CP 2000 7/6	7300	170 (70)	ND (2400)	ND (ND)	1400 (110)	130 (44)	73	630
Ely	0800 7/7 0800 7/8	993	MP 2000 7/7	580	270	ND	ND	430	170	120	D
Ely	0300 7/8 1000 7/9	1128	MP 2100 7/8	230	10	ND	ND	12	3.0	4.9	D
Ely	1000 7/9 0900 7/10	957	MP 2130 7/9	270	35	ND	ND	39	22	13	D
Ely	0900 7/10 1000 7/11	1063		22j							
Eureka	0640 7/6 2100 7/6	559	MP 1350 7/6	3.3j	ND (.22)	ND (4.2)	ND (ND)	ND (.40)	ND (ND)	.85	1.5
Eureka	2100 7/6 0645 7/7	398	MP 0153 7/7	4.1j	ND (ND)	ND (2.3)	ND (ND)	ND (ND)	ND (ND)	.93	1.0
Eureka	0645 7/7 0640 7/8	957	MP 1343 7/7	63j	17	ND	ND	ND	13	4.0	2.6
Eureka	0640 7/8 0640 7/9	998		23j							
Eureka	0640 7/9 0635 7/10	957		14j							
Eureka	0635 7/10 0640 7/11	1002		12j							

Notes: Gross beta air filter results at all other locations were essentially background on July 6-11, 1962.
CP = Cloud passage time.
MP = Mid-point of collection time.
ND = Not Detected.
D = Detected, but not quantitated.

Table VIII
Air Sampling Gross Beta and Isotopic Activity Results
Project Sedan

LOCATION	TIME-DATE COLLECTION	VOLUME OF AIR SAMPLED M ³	TIME ACTIVITY EXTRAPOLATED TO	GROSS BETA	GLASS FIBER FILTER & CHARCOAL CARTRIDGE (IN PARENTHESES) ACTIVITY (μuc/M ³)						
					I ¹³¹	I ¹³³	I ¹³⁵	Te ¹³²	Ba ¹⁴⁰ La	Ru ¹⁰³	Zr-Nb ⁹⁵
Groom Lake	0810 7/6 1215 7/7	1240	MP 7/6	140	4.2 (6.5)	ND (220)	ND (510)	5.2 (ND)	ND (ND)	ND	1.3
Groom Lake	1215 7/7 1300 7/8	1000	MP 7/8	2.3j	(D)	(ND)	(ND)	(D)	(ND)	(ND)	
Groom Lake	1300 7/8 1525 7/9	2153	MP 7/9		(ND)	(ND)	(ND)	(ND)	(ND)	(ND)	
Groom Lake	1530 7/9 1010 7/10	775	MP 7/10	74	4.3 (4.0)	ND (D)	ND (ND)	2.6 (1.6)	2.0 (.82)	1.7 (ND)	1.9
Groom Lake	1015 7/10 0350 7/11	1095	MP 7/10	58	2.9 (2.5)	ND (D)	ND (ND)	5.0 (.91)	2.0 (.40)	1.4 (ND)	1.3
Hiko	0700 7/6 0700 7/7	1224	MP 7/6	3.0j	ND (ND)	ND (5.0)	ND (6.8)	ND (ND)	ND (ND)	.41 (ND)	1.6
Hiko	0700 7/7 0700 7/8	2443		4.2j							
Hiko	0700 7/8 0700 7/9	1224		3.7j							
Hiko	0700 7/9 0700 7/10	1123		4.1j							
Hiko	0700 7/10 0700 7/11	1123		2.4j							
Lockes	1615 7/5 1315 7/6	375	MP 7/6	2.7j	ND (.14)	ND (1.5)	ND (ND)	ND (.31)	ND (ND)	.91 (ND)	1.9
Lockes	1315 7/6 1315 7/7	1000	CP 7/6	5200	390 (49)	ND (200)	ND (ND)	1000 (39)	340 (13)	130	700

Notes: Gross beta air filter results at all other locations were essentially background on July 6-11, 1962.

CP = Cloud passage time.

MP = Mid-point of collection time.

ND = Not detected.

D = Detected, but not quantitated.

j = Decay studies were not run on these filters and extrapolated activity results, therefore, are not available.
Activity shown is that at time of count.

Table VIII
Air Sampling Gross Beta and Isotopic Activity Results
Project Sedan

LOCATION	TIME-DATE COLLECTION	VOLUME OF AIR SAMPLED M ³	TIME ACTIVITY EXTRAPOLATED TO	GLASS FIBER FILTER & CHARCOAL CARTRIDGE (IN PARENTHESIS) ACTIVITY (μC/M ³)							
				GROSS BETA	I 131	I 133	I 135	Te 132	Ba 140 La 140	Ru 103	Zr-Nb95
Lockes	1315 7/7	245	MP 1722 7/7	2600	76	ND	ND	140	50	29	D
Lockes	2130 7/7	983	MP 0245 7/9	480	16	ND	ND	22	8.5	7.6	D
Lockes	1615 7/9	775	MP 0415 7/10	160j	27				15	5.8	1.5
	1615 7/9										
	1615 7/10										
Lund	0900 7/6	374	CP 1820 7/6	4700	680	ND	ND	1100	670	140	ND
Lund	1913 7/6	835	MP 0700 7/7	1300	230	ND	ND	340	150	65	ND
Lund	1921 7/6	835	MP 0653 7/8	310	10	ND	ND	14	4.9	3.4	3.4
Lund	1844 7/7	883	MP 0720 7/9	620	17	ND	ND	22	10	4.4	2.0
Lund	1905 7/8	897	MP 0757 7/10	280	41	ND	ND	47	27	19	D
Lund	1935 7/9	873									
Lund	1943 7/9	873									
Lund	2010 7/10	803		35j							
Lund	2040 7/10										
Lund	1945 7/11										
Panaca	1100 7/9	1836	MP 2300 7/9		ND				4.1	3.3	9.9
Panaca	1100 7/10								1000	350	ND
Penoyer	1105 7/6	536	CP 1215 7/6	8800	1100 (75)	ND (3900)	ND (9300)	4200 (ND)	(ND)		
Penoyer	0245 7/7				22	ND	ND	37	12	ND	D
Penoyer	0930 7/7	238	MP 1305 7/7		(10)	(260)	(ND)	(4.8)	(1.8)	(ND)	
Penoyer	1640 7/7										

Notes: Gross beta air filter results at all other locations were essentially background on July 6-11, 1962.
 CP = Cloud passage time.
 MP = Mid-point of collection time.
 ND = Not detected.
 D = Detected, but not quantitated.
 j = Decay studies were not run on these filters and extrapolated activity results, therefore, are not available.
 Activity shown is that at time of count.

Table VIII
Air Sampling Gross Beta and Isotopic Activity Results
Project Sedan

LOCATION	TIME-DATE COLLECTION	VOLUME OF AIR SAMPLED M ³	TIME ACTIVITY EXTRAPOLATED TO	GLASS FIBER FILTER & CHARCOAL CARTRIDGE (IN PARENTHESIS) ACTIVITY (μC/M ³)									
				GROSS BETA	I ¹³¹	I ¹³³	I ¹³⁵	Te ¹³²	Ba ¹⁴⁰ La ¹⁴⁰	Ru ¹⁰³	Zr-Nb ⁹⁵		
Tonopah	0710 7/6 0930 7/7	1032	MP 2120 7/6	2.9j	ND (ND)	ND (1.3)	ND (ND)	ND (ND)	ND (ND)	.64	1.1		
Tonopah	0930 7/7 0900 7/9	1238		13j									
Tonopah	0900 7/9 0800 7/10	331		2.7j									
Tonopah	0800 7/10 1310 7/11	1336		2.9j									
Tonopah Test Range	0900 7/6 0900 7/9	2443		13j									
Tonopah Test Range	0900 7/9 0900 7/10	1020		3.5j									
Tonopah Test Range	0900 7/10 0900 7/11	1020		6.2j									
Twin Springs	0600 7/6 0600 7/7	917	CP 1413 7/6	3200	140 (12)	ND (79)	ND (ND)	240 (11)	160 (3.9)	6.1	ND		
Twin Springs	0600 7/7 0600 7/8	1000	MP 1800 7/7	1800	38 (6.9)	ND (190)	ND (ND)	80 (5.5)	27 (2.0)	15 (1.0)	D		
Twin Springs	0600 7/8 0600 7/9	1020	MP 1800 7/8	300	ND (3.5)	ND (D)	ND (ND)	ND (2.4)	ND (1.1)	1.8 (.67)	1.5		
Twin Springs	0600 7/10 0600 7/11	767		14j									

Notes: Gross beta air filter results at all other locations were essentially background on July 6-11, 1962.

CP = Cloud passage time.

MP = Mid-point of collection time.

ND = Not detected.

D = Detected, but not quantitated.

j = Decay studies were not run on these filters and extrapolated activity results, therefore, are not available.
Activity shown is that at time of count.

Table VIII
Air Sampling Gross Beta and Isotopic Activity Results
Project Sedan

LOCATION	TIME-DATE COLLECTION	VOLUME OF AIR SAMPLED M ³	TIME ACTIVITY EXTRAPOLATED TO	GLASS FIBER FILTER & CHARCOAL CARTRIDGE (IN PARENTHESES) ACTIVITY (μuc/MS)							
				GROSS BETA	I ¹³¹ ND (.23)	I ¹³³ ND (3.3)	I ¹³⁵ ND (ND)	Te ¹³² ND (.30)	Ba ¹⁴⁰ La ¹⁴⁰ ND (ND)	Ru ¹⁰³ .48	Zr-Nb ⁹⁵ 1.0
Warm Springs	1040 7/6	917	MP 2240 7/6	3.4 ^j							
	1040 7/7										
Warm Springs	1045 7/7	320		67 ^j							
	0600 7/8										
Warm Springs	0600 7/8	960		5.2 ^j							
	0600 7/9										
Warm Springs	0600 7/9	960		5.6 ^j							
	0600 7/10										

Notes: Gross beta air filter results at all other locations were essentially background on July 6-11, 1962.

MP = Mid-point of collection time.

ND = Not detected.

j = Decay studies were not run on these filters and extrapolated activity results, therefore, are not available.
Activity shown is that at time of count.

Chapter XI

Water and Vegetation Sampling

Water samples were taken from surface supplies at seven locations, none of which is used for human consumption. The gross beta and isotopic spectroscopy results for these samples are listed in Table IX.

Subsequent sampling of human consumption supplies (underground sources) in the cloud passage area has indicated no rises in activity above normal background levels since the Project Sedan event. There are no known surface supplies being used for human consumption in the off-site area. (Except for Lake Mead near Las Vegas.)

Vegetation sample isotopic analysis results are presented in Table X. There was no conformity in the type of vegetation sampled at different locations, and therefore no specific pattern of activity can be expected from these samples.

TABLE IX
WATER SAMPLING RESULTS
PROJECT SEDAN

LOCATION	DATE COLLECTION	CLOUD PASSAGE TIME	$\mu\text{mc/l}$ AT CLOUD PASSAGE TIME					
			GROSS BETA	I ¹³¹	I ¹³³	I ¹³⁵	Te ¹³²	Ba ¹⁴⁰ La ¹⁴⁰
Currant Creek, 1 mile NE of Currant	7/7/62	7/6-1730		390	ND	ND	2,100	ND
Humbolt River, near Elko	7/7/62	7/6-2400			ND	ND	470	
Illipah Reservoir, Moor- man Ranch	7/7/62	7/6-1915			ND	ND	280	
Irrigation Canal, near Duckwater	7/7/62	7/6-1800		830	ND	ND	2,400	ND
Adaven (stream water)	7/7/62	7/6-1430		2,800	ND	ND	5,200	ND
Twin Springs Pond	7/8/62	7/6-1418	23,000 ^k					
Twin Springs Pond	8/1/62	7/6-1418	2,900 ^k					
White River, near Gardner Ranch	7/7/62	7/6-1800		ND	ND	ND	2,000	ND

All samples are from surface supplies and are not used for human consumption.

Notes: ND = Not detected at count time.
D = Detected, but not quantitated.
k = Count time activity.

TABLE X
VEGETATION SAMPLING RESULTS
PROJECT SEDAN

LOCATION	AZIMUTH, DEGREES	DISTANCE MILES	DATE COLLECTION	CLOUD PASSAGE TIME	$\mu\text{c/g}$ AT CLOUD PASSAGE TIME						95 Zr ⁹⁵ ND
					I ¹³¹	I ¹³³	I ¹³⁵	Te ¹³²	Ba ¹⁴⁰ La	Ru ¹⁰³	
Adaven	20	71	7/7/62	7/6-1430	1,400	D	ND	3,900	930	550	ND
Casey Ranch	15	79	7/7/62	7/6-1600	3,500	D	ND	7,100	1,900	1,400	ND
Cherry Creek Summit	17	78	7/6/62	7/6-1530	43,000	D	ND	90,000	1,900	1,400	ND
Currant (6 miles south)	14	107	7/7/62	7/6-1730	38,000	D	ND	6,100	1,900	1,900	ND
Currie (10 miles west)	17	233	7/7/62	7/6-2400	ND	D	ND	ND	ND	ND	420
Diablo	359	53	7/6/62	7/6-1302	7,800	D	ND	15,000	3,500	2,900	ND
Diablo	359	53	7/7/62	7/6-1302	8,100	D	ND	14,000	4,100	2,900	ND
El Dorado	4	153	7/7/62	7/6-2100	ND	D	ND	ND	ND	ND	ND
Eureka (5 miles south)	2	158	7/7/62	7/6-2100	ND	D	ND	ND	ND	ND	ND
Moorman Ranch	13	156	7/7/62	7/6-1915	440	D	ND	900	230	160	ND
Nyala	12	77	7/7/62	7/6-1430	360	D	ND	700	220	150	ND
Penoyer	22	37	7/7/62	7/6-1215	2,700	D	ND	4,500	1,500	930	ND
Queen City Summit	11	40	7/7/62	7/6-1224	43,000	D	ND	90,000	1,900	1,400	ND
Pine Creek Ranch	20	62	7/6/62	7/6-1430	2,800	D	ND	5,100	1,400	1,000	ND

Notes: ND = Not detected at time of count.
D = Detected, but not quantitated.

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LRL	215F	Structure Response
LRL	216P	Crater Measurements
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UCLA	225P Pt. I and II	Fallout Characteristics

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LRL	232P	Yield Measurements
EGG	233P	Timing and Firing
WES	234P	Stability of Cratered Slopes
LRL	235F	Seismic Velocity Studies

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ABBREVIATIONS FOR TECHNICAL AGENCIES

STL	Space Technology Laboratories, Inc., Redondo Beach, Calif.
SC	Sandia Corporation, Sandia Base, Albuquerque, New Mexico
USC&GS	U. S. Coast and Geodetic Survey, San Francisco, California
LRL	Lawrence Radiation Laboratory, Livermore, California
LRL-N	Lawrence Radiation Laboratory, Mercury, Nevada
Boeing	The Boeing Company, Aero-Space Division, Seattle 24, Washington
USGS	Geological Survey, Denver, Colorado, Menlo Park, Calif., and Vicksburg, Mississippi
WES	USA Corps of Engineers, Waterways Experiment Station, Jackson, Mississippi
EGG	Edgerton, Germeshausen, and Grier, Inc., Las Vegas, Nevada, Santa Barbara, Calif., and Boston, Massachusetts
BYU	Brigham Young University, Provo, Utah
UCLA	UCLA School of Medicine, Dept. of Biophysics and Nuclear Medicine, Los Angeles, Calif.
NRDL	Naval Radiological Defense Laboratory, Hunters Point, Calif.
USPHS	U. S. Public Health Service, Las Vegas, Nevada
USWB	U. S. Weather Bureau, Las Vegas, Nevada
USBM	U. S. Bureau of Mines, Washington, D. C.
FAA	Federal Aviation Agency, Salt Lake City, Utah
REECO	Reynolds Electrical and Engineering Co., Las Vegas, Nevada

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